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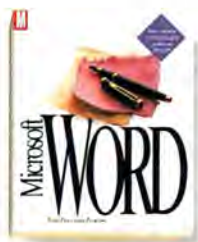
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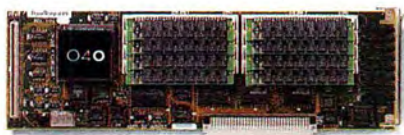
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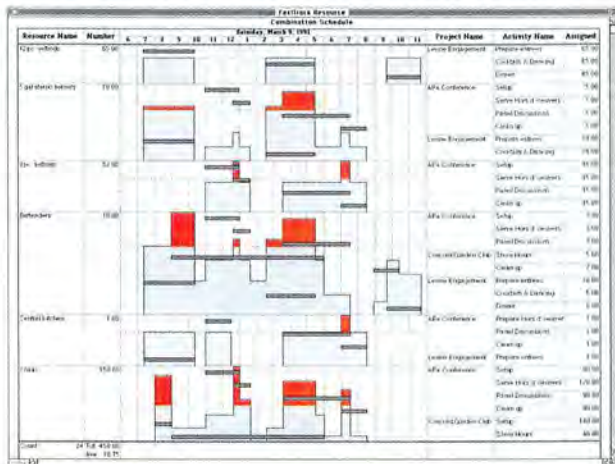
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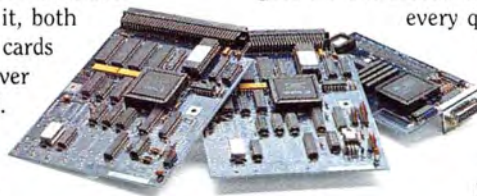
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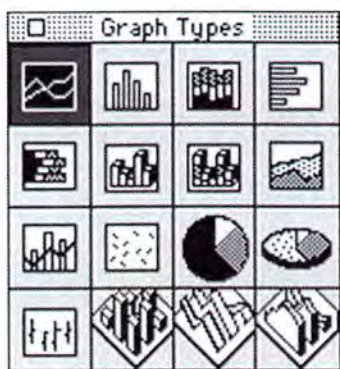
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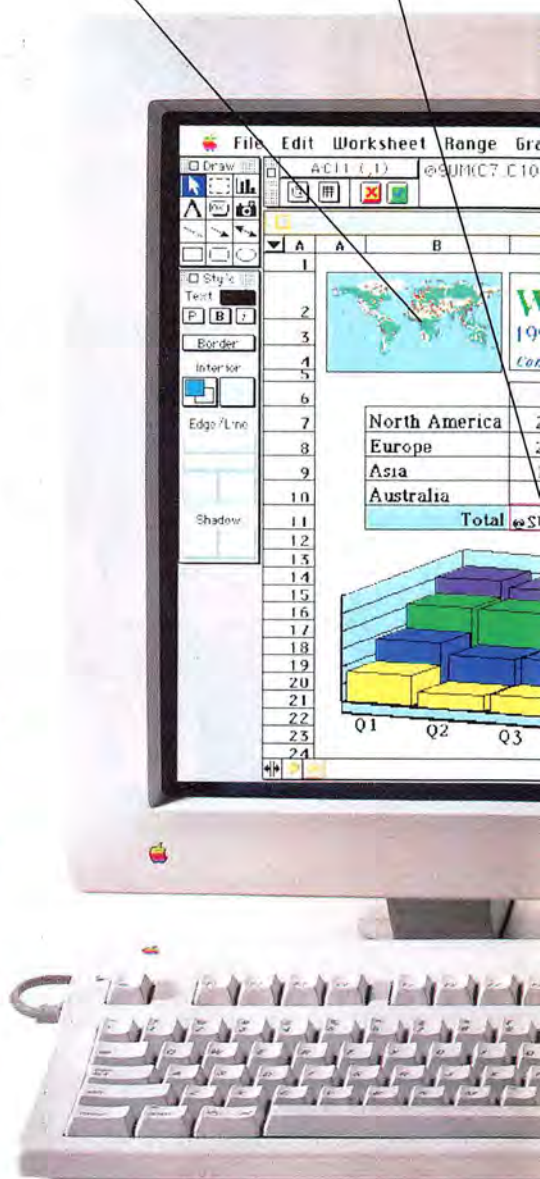
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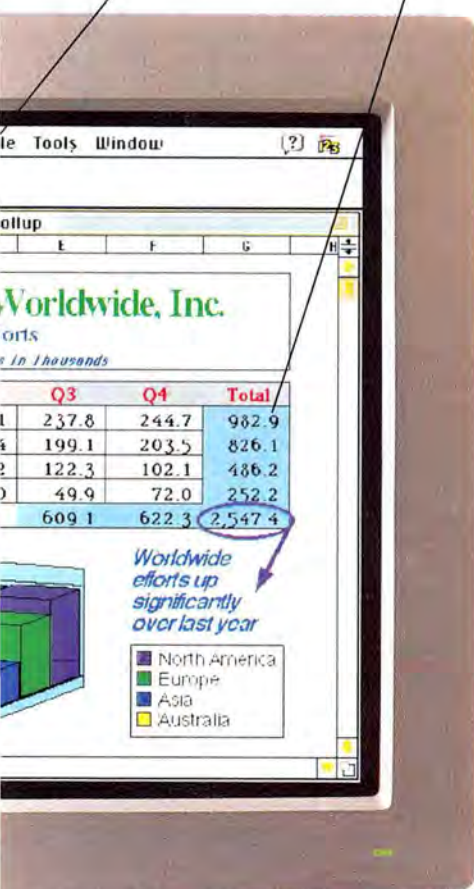
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About

About MacUser

A New Kind of Artist

At MacUser, it's not just the Labs staff members who push the limits of technology. With a little help from Photoshop 2.01, associate technical art director Peter Gould has lately (January '92, pages 130 and 131, and February '92, pages 194 and 195) been producing vivid cutaway images of hardware so authentic that art directors from all over the country have been calling him up to ask him about his technique.


This month, one of Peter's unique cutaways graces our cover for the first time. Here's how Peter created the image.

He first disassembled an APS Quantum 210 ZFP hard-disk drive, cleaned and polished each component, and put it back together (leaving out the screws). Then, using a 4x5 Sinar P2 camera equipped with a macro lens and set on a tripod, he shot each layer of components from several angles. He also shot Polaroid pictures to help him design the structure of the final composite image. The outside layer, just a standard product shot, was the easiest, whereas the inside layers required some careful lighting. Then, to make sure he had collected all the pieces of his puzzle, Peter worked up a comp from photocopies of the Polaroids.

To get the images into his computer, Peter had the film scanned by a high-resolution Scitex CT and pulled the raw scans into Photoshop 2.01. At this point, although the images were to be touched up, just as each image electronically removing blemishes, el-

Once the component images were clean, Peter assembled them into the desired composite, using Photoshop's cut-and-paste tools. To get the effect of cutaway edges without cut-and-paste traces, he retouched the image with Photoshop's retouching tools, blurring and feathering the edges until the image was sleek and seamless.

The whole process took about 12 hours, half of that in photography and half in Photoshop image editing. "We used to either annotate a photograph, which didn't show you much," Peter says, "or create illustrations of the insides from scratch, which was very labor-intensive and not as realistic. I think of this technique as a hybrid between photography and illustration."

Peter modestly says that anyone with a little bit of patience and an eye for detail can do it, and technically he's right. But that leaves out the art. He adds, "There's a lot of previsualization involved. It's really a new kind of art, with the result being the best of both worlds: photo-realistic illustration." 



Associate technical art director Peter Gould uses Photoshop to peel open products on film.

PHOTOGRAPHY BY IRENE EGER

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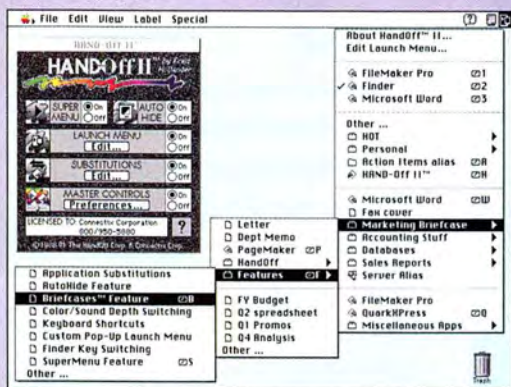
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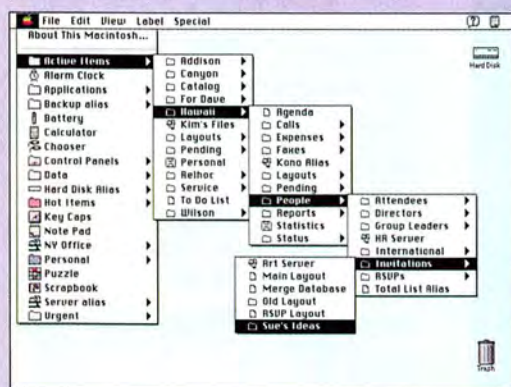
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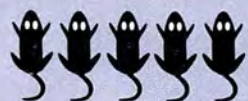
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- MACWEEK

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Richard Rossiter, of Fairfield, Connecticut, says he loves MacUser but voices a reservation: "SCSI me, but the one problem I have with your publication is all the acronyms INIT. It was very TIFF for me to understand what you were saying without knowing what all those initials meant. I was dumb-founded by WYSIWYG and went ROMing through your pages for a clue."

GUI, we're sorry. At the RISC of RAMming you with more jargon, we suggest that you get our glossary of acronyms ASAP from the Download & Support forum of Zmac (get the file ACRNYM.TXT in Library 7). Of course, you'll need to make sure you have the right bps and BBS.

✉ Write to Letters to the Editor, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404, or post your letter on the MacUser Forum of ZiffNet/Mac, our on-line service (also known as Zmac).

All letters become the property of MacUser, and we reserve the right to edit any letters we print. Please include a return address and a daytime phone number.

Upgrade Tirades

After reading "The Classic II: Two Times a Classic," (December '91, page 121), I wonder: Am I the only one who wants to know where the LC II is? As a prospective Macintosh LC buyer, it frustrates me that the lower-cost Classic II has a faster 68030 16-megahertz processor that fully supports all of System 7's features, including virtual memory, whereas the more expensive LC is inhibited by a 68020 16-megahertz processor. Not only is the Classic II generally faster than the LC but it can also take advantage of programs written to work optimally with a 68030-based machine. It only seems logical that the Classic will be discontinued. After that, Apple would be foolish to maintain the 68020-based LC, because everything from the Classic II to the IIfx (excluding the PowerBook 100) would be 68030-based.

As an orphaned Mac Plus owner, I don't trust Apple to offer an upgrade. When will Apple do it right the first time?

Don C. Steinbarger
Austin, TX

Macintosh Users for Plus Enhancement (MUPE) is a new special-interest group I'd like to start for the thousands of Mac Plus owners, like me, who have fallen victim to Apple's neat little trick. I'm talking about soldered ROMs, barring me from upgrading my Mac Plus. How about removing the ROMs and soldering a socket? Or better yet, how about a SIMM-mounting platform for ROM upgrades in their place?

Perhaps I don't know as much about computers as I thought I did, but one thing I do know about is Apple's business practice of built-in obsolescence. Having been a faithful Mac owner since Macs were first introduced

in 1984 (when my Plus was only a Mac 128K), it really hurts.

William Bruchert
Chicago, IL

We doubt that Apple has a secret planned-obsolescence policy. After all, Apple has had upgrades (usually a logic-board swap) for many a Mac model. But even some newer Mac models (such as the IIfx) that have a vacant built-in ROM socket have failed to exploit this capacity. For example, when the IIfx balked at System 7, no new ROMs were offered to fill it, because it was cheaper and just as effective to create a software solution (MODE32, available free to anyone via on-line services such as CompuServe or America Online, or from your local user group or dealer). As for the LC, our best guess is that Apple will provide an '030 upgrade for it sometime in '92. By the way, the ROM isn't the only obsolete part in the Plus.

—JR

Give Me a Break

I'm afraid many readers won't get Michael Swaine's point about taking time for a physical break ("I Break for Productivity," January '92, page 41), because they're too busy trying to get some work done.

Technology pushes us to go faster and faster. New technology (computers included), while removing much of the drudgery from onerous tasks, actually increases the pressure on us to produce. Say an eight-hour task can be completed in half the time with new technology. Does this mean that you can go home at noon and receive the same pay? NO! You'll be given additional work to do in the same eight hours. Which is why it's essential to take that half-hour walk two or three times a day.

And congratulations for putting out the January edition in November! Does that mean

Dear Mr. Sculley . . .

As keynote speaker at this year's CES, Mr. Sculley announced that Apple's first consumer-electronics goodies might be on the shelves in time for holiday shoppers. What exactly those goodies will be, though, he refused to say.

Speak Up:

What kinds of consumer electronics would you like to see with an Apple logo on them?

✉ Send your thoughts to Dear Mr. Sculley, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

Regarding the Apple/IBM joint ventures called Taligent and Kaleida, Kristy Lantz Astry, of Denver, Colorado, likes their new logos, but we sense

some sarcasm in her interpretation of the names that go along with them. "Kaleida reminds me of the saying 'when worlds collide-a,' which in this case is true. They sure were 'telligent to think of that. Hyuk."

Brian Marantz, of Salt Lake City, Utah, wants Apple and IBM to agree on a name that reflects the process of computer buying, and he found it right under Big Blue's nose. "Apple and IBM didn't need to go very far to look for a name for their joint venture—IBM also stands for 'I Buy Macintosh.'"

Michael D. Cooper, of Perkassie, Pennsylvania, thinks "an appropriate name for the multimedia joint venture is Vaudeville. The Taligent replacement I suggest is 'FUBAR.'" FUBAR? Foolishly United Beyond All Recognition?

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LETTERS

you got all of December off?

William E. Sydnor
San Luis Obispo, CA

Nope, we worked right through December to get the magazine to you on schedule — our schedule, that is. Typically, we get the magazine out on the newsstands between the 10th and the 25th of the month preceding the cover date. We accelerate the delivery to subscribers so that they can read MacUser a few days earlier and have more time for those productivity breaks Michael Swaine suggested. — NP

Compact Answers

The article "The Incredible Shrinking File" (January '92, page 202) is the perfect at-a-glance view of the electronic world and fetching files. Well, it would be the perfect view if it weren't for a few errors:

BinHex: Although some earlier versions of BinHex could convert a binary file to a text file, BinHex 5.0 cannot. BinHex 5.0 performs only MacBinary translation.

PackIt III: Compact Pro cannot open PackIt III archives.

Self-extracting archives: It's misleading to say that DeSEA opens self-extracting archives. DeSEA doesn't gain access to the contents; it strips off self-extraction code from some file-compression utilities.

StuffIt: With both StuffIt Classic and StuffIt Deluxe, you can create StuffIt 1.5.1-format archives. These archives can be extracted with ShortCut, UnstuffIt Deluxe, Compact Pro, DiskDoubler, and SuperDisk! Utilities. All StuffIt archives can also be opened within HyperCard, MicroPhone II, and QuicKeys 2 if you have StuffIt Deluxe on your machine.

UnStuffIt should be called UnStuffIt Deluxe to distinguish it from its predecessor, UnStuffIt 1.5. UnStuffIt Deluxe can get to all StuffIt formats, whereas UnStuffIt cannot.

Joe Sewell
Melbourne, FL

PostScript 2 Preview

A lot of laser-printer companies are getting into bed with the new, "improved" PostScript Level 2 from Adobe, all in the name of increased speed. Although it does seem to boost the performance of 6 ppm laser printers to about 9 ppm, here's a friendly warning to all concerned: Adobe PostScript Level 2 is not necessarily compatible with PostScript!

In fact, Adobe's own Smart Art series

of custom-text-effects software is not compatible with Adobe's PostScript Level 2. If Adobe's own software doesn't function correctly with Level 2, then there are, no doubt, other compatibility problems yet to be uncovered.

Harry Sweeney
Portland, OR

In your case, the problem is most likely Smart Art's, not PostScript Level 2's. However, we've heard similar comments from other readers who were using other software. We're planning a future lab report on Level 2 printers and are compiling Level 1-compatibility test files for that purpose. If you or any other readers would like to share your problem files with us, we'll consider them for inclusion in our test suite. — HB

A View from the TopDown

An inaccuracy in your review of TopDown ("Quick Clicks," January '92, page 86) concerns a fundamental feature. It isn't true that "The appearance of TopDown documents can easily become cluttered, because symbols must always appear separately from the text that describes them." Also, although it is true that TopDown doesn't provide Bézier curves, the Bézier line in TopDown's competitor forces users to spend a great deal of time managing its shape while trying to ensure that it doesn't curve inside a symbol.

Wendy S. Sternick, President
Kaetron Software
Houston, TX

Our review was indeed in error. Contrary to what we stated, text labels can be placed within symbols, which eliminates the objection that TopDown charts can easily become cluttered-looking. — SJ

Title Bout

We have some new names Que could use for its book to avoid confusion with Robin Williams' *The Little Mac Book* (solicited by Guy Kawasaki in his column "Anything Is Possible," January '92, page 29); *Inside Macintosh, Volume VIII* (trick everyone into thinking it's the next volume); *The Macintosh Bible* (Que could say that it was Moses who gave it the idea for the name); *Macintosh Revealed, Volume Five: Copying the Toolbox* (beat Hayden Books on its next release); *The Macintosh Way* (give Guy something to really gripe about).

Jim and Dana Webb
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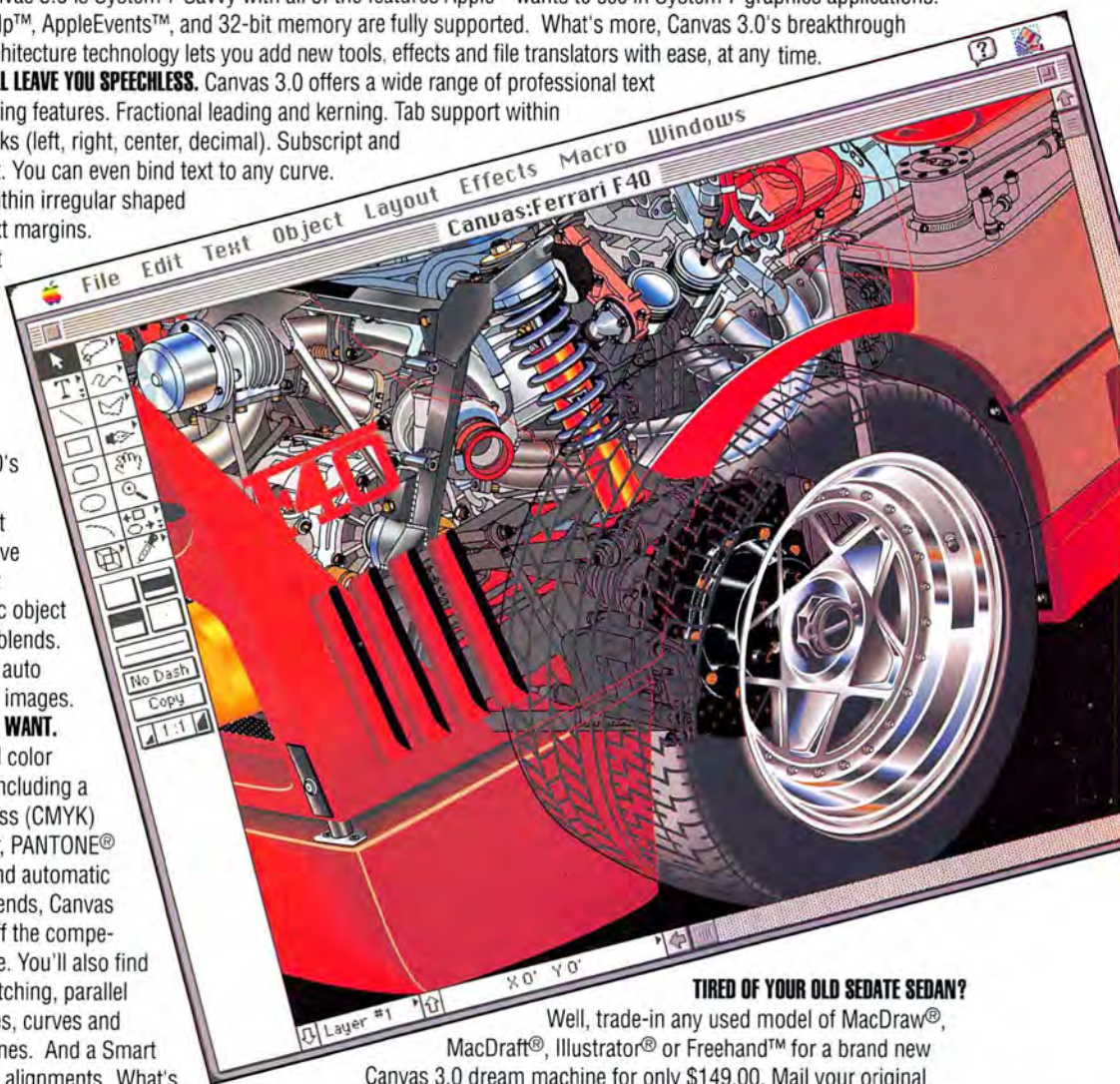
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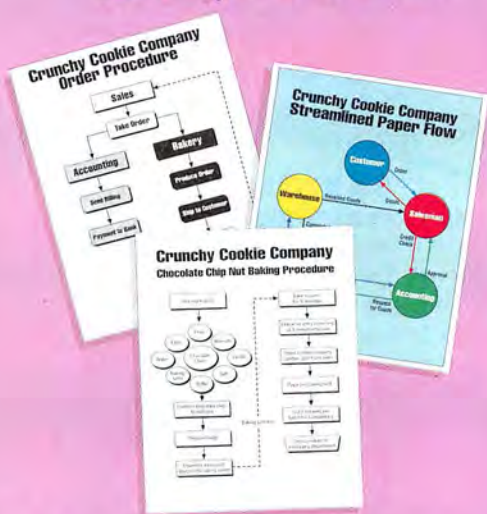
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LETTERS

Guy's "Anything Is Possible" column is true evangelism: the passionate selling of a cause. I bet — at least I sincerely hope — that Que will be inundated with indignation. In the words of my revered English teacher, "You done good."

Richard Theriault
Clearwater, FL

I remember the day that Robin Williams told us, her PageMaker class, in a slightly horrified voice, that Guy Kawasaki was coming to interview her. "If someone like Guy Kawasaki is coming up to your house to interview you and you have only a bed to sit on, do you change the sheets?"

Noreen Skelly
Davis, CA

I hear through the grapevine that Que has received thousands of letters and faxes from all over the country, chastising it for using the title *The Little Mac Book*. I wish I could thank every one of you with a basket of flowers and a box of chocolates. I hope that Que and other large corporations will see beyond titles and numbers and look at the human beings behind them. The author of Que's *Little Mac Book*, Dr. Neil Salkind, who voiced an objection to the title, is also getting hurt, as is Peachpit, and ultimately, Que.

Robin Williams
Santa Rosa, CA

Guy Kawasaki has taken cheap-shot journalism to a new low in his emotional article about *The Little Mac Book*. I expect this kind of writing in *The National Enquirer* but not in a reputable magazine such as *MacUser*.

Where's the fairness in this article? The balance of facts on both sides of the issue?

It appears from the meager facts Kawasaki provided that Que's book either had already been published or was close to being published when the other Mac book hit the streets, which would certainly rule out the possibility of Que's having deliberately benefited from someone else's work.

Mike La Bonne
Indianapolis, IN

I think you're way off base criticizing Que for giving a book the same name as Peachpit Press' *The Little Mac Book*. Writing a few letters won't change things. Of course, you can't copyright a title.

I don't believe that Que's rival title has hurt Ms. Williams' sales or her writing

career. In fact, the reverse may be the case. With Que's title out there, it's promoting the title of her book. When a writer takes a proposal to a new company, that company wants to know one thing: How many copies of how many books have you sold? If I were Robin, I'd be inclined to say, "I wrote *The Little Mac Book*" and just shut my mouth there.

Deirdre Maloy
Queensbury, NY

Guy Kawasaki concluded that Que "wronged" Robin Williams. Why? I will not answer Ms. Williams' allegations of malice. They are not true. But malice is not what this is about. It is about "niceness" and the apparent lack of humanity in large corporations.

How does anyone prove niceness? It is a quality of character that you judge after you know someone for a while. Robin Williams does not know me or the people at Que. Yes, Que is the largest computer-book publishing company, and that, I suppose, makes some people think of IBM, or Microsoft, or even Apple. But we are a small fraction of the size of any of those companies.

We're proud of who we are at Que, and the charge of being "not nice" hurts us. We wonder how a group of people who used to be the most conscientious, hard-working, considerate, and "human" people you could find anywhere could suddenly lose all our humanity simply because we are now the biggest company in the business.

Not long after we came up with the title of our book *The Big Mac Book* in 1988, I knew that we would follow it with a Little Mac companion. It was a natural. Then Peachpit Press took a book that had had the title *Macintosh Basics: An Informal Guide to Using the Macintosh* and published it under the title *The Little Mac Book*. I was astounded. Peachpit took my title. Sure, it changed the word *Big* to *Little* and it got its book out before I did. But who are we kidding? That title was mine, and Peachpit took it.

So where does this leave us? I intend to follow the specific suggestion of many of your readers. The new editions of both books are being named *Que's Big Mac Book* and *Que's Little Mac Book*. I wish Robin Williams success with her book. Our books are very different, and any Mac user would be well served to have both.

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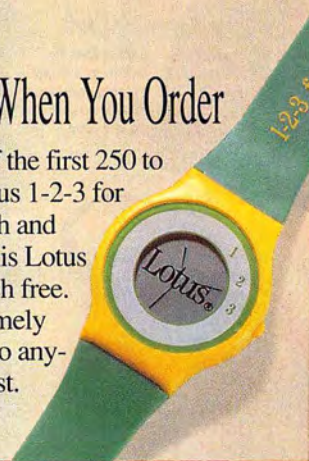
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TM445

Working on Workstations

There are several problems with the table comparing the pros and cons of Macs and workstations in the article "When Worlds Collide: Macs Versus Workstations" (January '92, page 112). Why is the Mac knocked for not having a RISC processor? Surely you folks don't still believe that RISC will save the world! All the things that make RISC processors fast can and are being applied to CISC processors with equivalent results.

You list the Mac IIx as using A/UX 2.0, and yet you cite as a con its lack of preemptive multitasking. When a Mac is running A/UX, it is running UNIX, preemptive multitasking included.

Michael J. Gibbs
Surprise, AZ

We agree with your last point, but on the issue of RISC-based workstations, even though there is some overlap, the fastest CISC-based machines are still slower than the fastest RISC machines.

We may not think that RISC will save the world, but Apple and IBM seem to lean that way — witness their plans for codevelopment of a RISC-based workstation. — KW

Regarding the article on workstations, could someone please tell me what the difference/benefit is between Display PostScript and a Macintosh running ATM?

Brian Fette
Port Washington, WI

Display PostScript is a full PostScript interpreter, similar to the one in a PostScript printer. It can draw PostScript graphics and text directly to a computer screen, so what you see on-screen precisely matches what you get out of the printer. ATM (Adobe Type Manager) is capable of rendering only PostScript type on-screen, not graphics. — KW

Belly Up

In "Dual Dynamos: The Macintosh Quadra 700 and 900" (December '91, page 114), you state that the grooves or slots positioned on the bottom edge of all Macs have been transplanted to the top of the box of the Quadra 700. You warn about inserting a floppy disk upside down. Was this learned from experience? The photo of the Quadra on page 115 shows the Mac sitting under a monitor that is working, but the slots are on the bottom, hence your Mac is upside down. Perhaps this picture was intended for Macintosh

users in the southern hemisphere.

Michael N. Witman
New Britain, CT

Let's not be hemispherist; from the point of view of the southern hemisphere, it was intended for those in the northern half. No matter what the hemisphere, you caught us with our Quadra upside-down. — NP

Crossed Wires

The response to D. Pirotte's letter on 10BASE-T (January '92, page 16) contains a serious error. Your editor says that the extra pair of wires of a four-wire phone cable can be used for 10BASE-T. Not so! 10BASE-T Ethernet requires four wires. I don't think that the editor meant to imply that you should take another pair of wires from another cable, which is not a good idea for wiring networks.

Dave Kosior
Fullerton, CA
You're right. — KW

Apple's Alphabet

John C. Dvorak made a good point when he poked fun at IBM, claiming that if it could, it would rename the Mac some "dopey number" ("Who Killed Apple?," January '92, page 316). But Apple itself is not entirely different. Just what do the letter combinations in the Mac names represent? Why call a Mac IIsi a Mac IIsi? Why not a IIsx? Or a Ilce? Or a . . .

Keith F. Luscher
Columbus, OH

According to Apple, the letters don't stand for anything. They're simply there to distinguish one machine from another. However, rumor at MacUser has it that c equals compact, i equals internal video, and sequals "dunno." The x in cx may have been put there because the machine was equivalent in power to the IIx. — HB

Clarifications

In the February '92 article on contact managers ("Staying in Contact," page 131), the rating for Market Master should have been 3.5 mice.

The correct number to call to inquire about PickTure ("The Ultimate System Folder," January '92, page 94) is (818) 840-8021, which is the customer-assistance number of Right Answers Product Development.

The number listed for Outbound Systems, Inc. (February '92, page 47), was a fax number. The correct phone number is (303) 786-9200.



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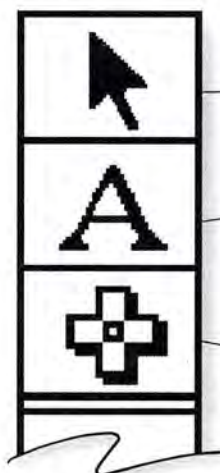
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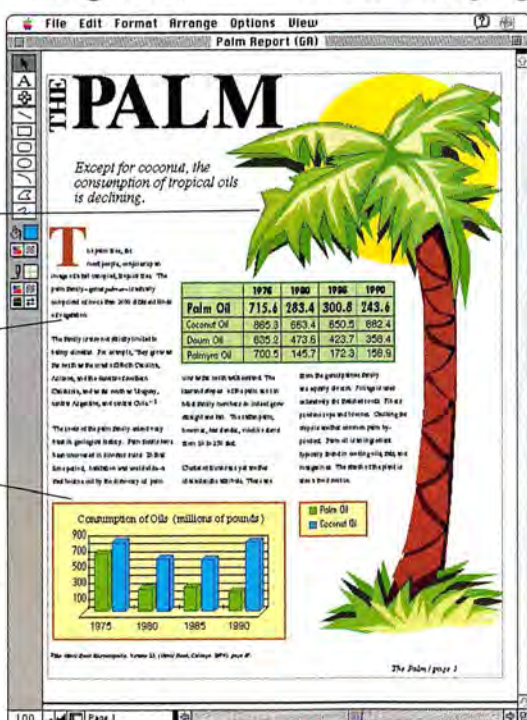


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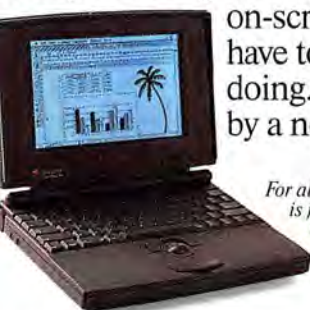
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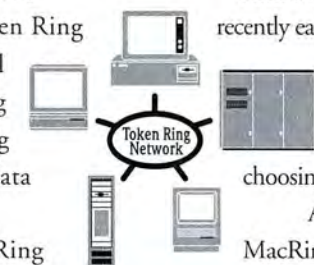
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Three Little Macs



When Apple takes on the consumer-electronics market, it'll challenge everything you thought you knew about how computers should look and act.

Success has taken much of the shine off Apple. Even with the low-cost Classics, the high-octane Quadras, the status-laden PowerBooks, and the quiet power of System 7, Apple watchers have been waiting for something to shake them to their core. And John Sculley thinks he has just the ticket: consumer electronics.

And Sculley needs a hit. Sure, Sculley can claim his share of successes during his years at the helm, but he's also responsible for his share of flops. Regardless of how you calculate his claim-to-fame/shame-and-blame ratio, some are suggesting that it's time for some fresh blood at the top.

Look at it this way: It wasn't until long after Sculley left Pepsi that the company got hip enough to bring in Michael Jackson and Ray Charles as its pitchmen. But Sculley is betting that the consumer-electronics market is going to help Apple — and Sculley — revisit their glory days.

Apple has danced around this market for years. In part, the Mac Classic was Apple's way of testing the waters for lower-priced mass-market products. And now Apple is ready to go head to head against such Japanese megacompanies as Sharp, Casio, and Nintendo, which dominate the market for hand-held personal-information and entertainment devices.

Earlier this year, Apple finally made it official: It plans to enter the consumer-electronics business with products due out by the end of 1992. What kind of products? My Japanese-made crystal ball is playing scenarios on three channels.

FYI: The Cw/BCD

First you'll see products such as a Classic with a built-in CD-ROM drive (Cw/BCD). To all appearances, a Cw/BCD made by the consumer-electronics group at Apple will be the same as a Cw/BCD built by the computer division. The difference: pricing and distribution channels. The consumer product will cost less (they'll leave out the SCSI port or find some other way to keep business buyers from buying it) and will be sold at your local Circuit City or Intelligent Electronics.

The second kind of consumer product will also essentially be a Cw/BCD. The difference here will be that it won't have a monitor (it will hook up to your TV) and will be in a box with a form factor more like your stereo equipment's than your computer equipment's.

And you'll use it more like stereo equipment than like computer equipment. In fact, one major use for it will be to control your other stereo equipment. How about menu-driven VCR programming that's really easy? You'll simply download a weekly menu of TV (and radio) shows from an on-line service that will place the week's fare into pull-down menus for easy selection.

Want to add more special effects for the SurroundSound module in your amplifier or turn camcorder images into QuickTime video postcards-on-a-floppy? No problem — just pop some new software into your Cw/BCD.

For this scenario to work, Apple needs to partner up with an established home-electronics maker, such as Sony, which will incorporate AppleTalk connectivity into its entire product line of TVs, VCRs, and videodisc and audio CD players. (If Apple is smart, this Cw/BCD will bear a Sony logo.)

Table of Contents

Apple will need to generate a huge library of titles for these machines. You wouldn't buy a VCR if there were only three movies to choose from at your local video store, and you won't buy a Cw/BCD unless there's plenty of content to make it worth the investment in a new piece of hardware.

Although it hasn't yet committed to a specific hardware platform, Microsoft has been buying up electronic-publishing rights to all kinds of material, from books to artwork. Content-based platforms may be one reason why Apple is enthusiastic about such products as Voyager's Expanded Books series of floppy-based novels.

But it's the third kind of consumer product that will be the most innovative: hand-held devices that will look like some kind of cross between a portable CD player, a Nintendo GameBoy, and a Sharp Wizard — what John Sculley calls personal digital assistants (PDAs).

A single-purpose machine such as a GameBoy or a pocket pager can easily be built with a tiny form factor. But if Apple's PDAs are to be more than toys or gadgets, they need to be multipurpose: for everything from scheduling, contact and sales tracking, and time billing to accessing data (such as travel information or your own custom CD-ROM database) that can be updated on-line.

A general-purpose PDA needs to store information, search through it efficiently, access the results, update the information on the fly, and reconcile that information with the data on

your desktop. But palm-sized machines pay a price: There are inherent limits to the kind of abilities you can build in to machines that small.

Apple's PDA needs a decent-sized, moderate-resolution display, something

more than the kind of scrolling character-based display you find on a pager. It needs to be able to store information in memory or play it from a small storage device (such as a floppy, a mini CD-ROM drive, or a ROM card of some kind).

Apple's PDA should have menu-based data retrieval that can be downloaded from a database on your desktop or from on-line services such as the OAG (Official Airlines Guide). You'll navigate through these menus with a minitrackball and forward/backward/home buttons.

All of this can be accomplished, at reasonable prices. The hard piece of the puzzle — the part that's kept the PDA market from exploding thus far — is data input. A standard keyboard doesn't work: It's too big, or the keys are too small, or it's just too awkward to balance the PDA on one hand while typing with the other.

A Small Voice

A partial answer is voice recognition. The level of voice-recognition technology required for simple menu navigation or for distinguishing the numbers 1 through 10 or the 26 letters of the alphabet can be miniaturized to PDA size. But that's far too clumsy for inputting free-form information.

One solution is to use menu-based choices to enter as much information as possible — dates and times from pop-up menus, names and places from a directory, and so on — complemented by voice annotations for the free-form data that isn't on the menu. Spoken comments are indicated with an on-screen icon and can be played back at the click of a button.

A few megabytes of storage are enough to store a few minutes' worth of spoken entries — sufficient for several dozen short annotations. Whenever your voice memory gets full, you just plug the PDA in to a phone line and it automatically calls your assistant's computer back at the home office and uploads your digitized voice memos; your faithful assistant (or perhaps a service bureau) transcribes the memos. The next time you call in, the PDA downloads the transcriptions.

The PDA keeps track of what data goes with which voice snippets and swaps the characters for the appropriate transcribed text. Once the transcription has been done, the voice memory is freed up for new recordings. (This can be done continuously, in the background, with the cellular-modem option.) If you ever run out of voice memory, you can resort to voice recognition, but you'll have to spell out words character by character.

One final off-the-cuff prediction: Apple's PDA should be small enough to wear on your wrist. Or maybe Sculley has something better up his sleeve. ☞



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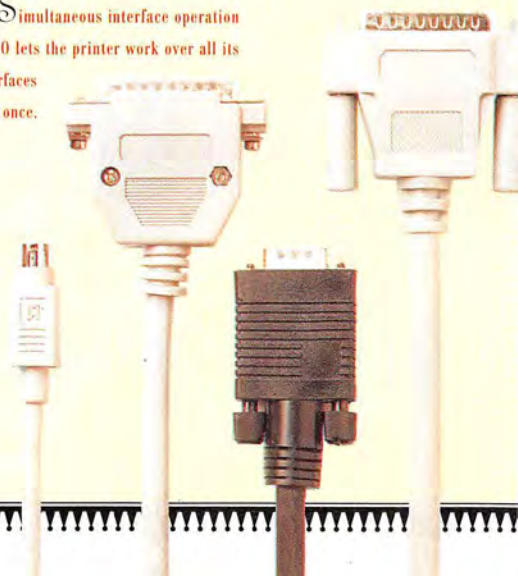
A ROM card gives the LAN administrator control over the printer's settings.



The QMS-PS 1700 carries a two-year warranty. QMS national service enjoys a 97% service satisfaction rating. And all consumables and accessories are available from one dependable source — us.



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You could compare the QMS-PS 1700 to the HP IIIsi, but there really is no comparison.

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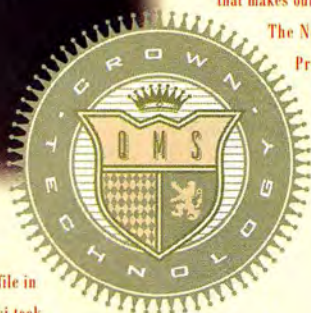
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The QMS-PS 1700 printed this file in seconds. The HP® LaserJet® IIIsi took seconds. That's almost 3 times as fast.



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Its input buffers increase throughput by spooling jobs so that host applications aren't hung up waiting for files to print.

The input capacity of the QMS-PS 1700 is 1,000 sheets. Output is 500. And there's an optional duplexer for two-sided work.

What's more, if a job is interrupted for any reason, this printer has the intelligence to reprint any needed pages and then continue with the job.

Its context switching capability preserves "states", such as fonts and macros, when switching between emulations so you needn't waste time downloading them each time an emulation is selected.

Storage capacity for font caching, and font or emulation storage, can be expanded with optional internal and external SCSI hard drives.

And there's even an optional System Security Card that lets the LAN administrator control settings and avoid the chaos that can result from unauthorized end-user adjustments.

The QMS-PS 1700 is quite a bit more than a laser printer. In fact, it's exactly what most work groups need but haven't been able to find. Until now. The QMS-PS 1700 is The Network Printer.



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If you think the only way to avoid running out of memory is to avoid running a couple of your favorite applications, think again.

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Instead of closing your applications, open a Suitcase.™

Suitcase is the award-winning utility that lets you park your growing collection of fonts, DAs, FKEYs and sounds *outside* the System File.

Thereby giving you the maximum amount of memory for running more applications, building bigger documents and doing other useful things.

What's more, Suitcase compresses your screen font and sound files by up to 60%.

Thereby giving you that much more precious disk space to work with.

It even lets you put your screen and printer fonts on a server for all to share.

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The more resources you have—and the more organized you are—the more memory and disk space you'll save.

But whether your dividends are measured in megs or merely in Ks, Suitcase is guaranteed to save you gigabytes of aggravation.



Even if you're operating in System 7.

Because System 7 still stuffs your resources into your System File.

And System 7 still makes you close down all your applications and restart your Mac each time you install a new font.

Which is a real pain in the, uh, system.

Suitcase, on the other hand, gives you unlimited access to all your resources.

And total control over how you organize them.

Each suitcase can pack up to 800 fonts, 64 DAs, and any number of FKEYs and sounds.

You can group suitcases into sets, then summon all the luggage that

Can't remember the difference between Versailles and Monaco? Not to worry. Suitcase displays your typefaces right in the menu.

belongs with a particular project at the click of a mouse.

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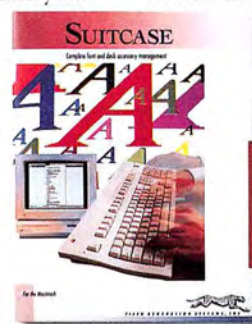
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If You Want to Program



How much does the inspiration to create truly great products cost these days? Just \$8.95 plus shipping and handling.

Brenda Ueland probably never used a Macintosh. She may have never used a personal computer at all. Nevertheless, her book *If You Want to Write* is the best book about programming ever written.

Ueland, a writer, editor, and teacher, died in 1985 at the age of 93. Too bad — I think she would have loved to write with a Mac. You've probably never heard of her unless you're a writer. (If you're a writer who hasn't heard of her, something is wrong with you.)

This column explains how to apply her principles of writing to programming. I hope this is OK with her and that she forgives me if it's not. I have a feeling, however, that she's Up There, smiling. If you're not a writer or a programmer, you should buy her book anyway to help you get through life.

I have a selfish motive. People often send me software, because they think that their product is going to blow me away and compel me to write a column about it. Dream on. Ninety-nine percent of the software I receive is not worth booting. I donate most of this stuff to my church. Companies can save me a lot of trouble by sending their software directly to Menlo Park Presbyterian Church, 950 Santa Cruz Avenue, Menlo Park, CA 94025; attention: Walt Gerber.

Seldom as it occurs, when I do see software I love, I call the company and try to buy a piece of the firm and perhaps get a seat on the board of directors. I call this the Guy's Golden-Touch Investment algorithm: "Whatever is gold, Guy touches." I've touched only three programs so far. I don't want to touch any more, but the Macintosh market could use a shot of innovation.

Talent and Originality

Ueland's book begins with a chapter entitled "Everybody is talented, original and has something important to say." It ends with a chapter entitled "'He whose face gives no light shall never become a star' — William Blake." Get the idea? Her book is about creativity, freedom, integrity, and courage in writing (and programming).

Her book is for aspiring writers and the aspiring writer in all of us. It is not for prissy, self-centered, "successful" writers who have convinced themselves that they know it all and who are trying to convince others that writing is for the intellectually elite. She in-courages writers — literally putting the *courage* in writers — to break the "oughts" of writing and

to find ways to express themselves.

In the same sense, this column is for aspiring programmers and the aspiring programmer in all of us. It is not for prissy, self-centered, "successful" programmers who have convinced themselves that they know it all and who are trying to convince others that programming is for the technically elite. I want to in-courage programmers to break the shackles of what software reviewers, Apple, and *Inside Macintosh* think Macintosh programs ought to be.

How to Program

There are three kinds of Macintosh software today: incremental upgrades of existing programs; incremental rip-offs of existing programs; and bizarre, touristy dreck that should be sold in hotel gift shops. All three are the products of either small minds or big minds constrained.

If development of these kinds of software continues, Macintosh will be slamed by the Peter Principle of Computing: A computer rises to the level of incompetence of its programmers. The only way to stop and reverse the Peter Principle is to listen to what Ueland has to say. Here is what she would tell you if she were alive and if she were a programmer:

Program Freely. Have rollicking fun when you program. Program as if you were creating something for your friends. Make programming easy on and interesting to yourself, without fear of failure. Thumb your nose at the know-it-alls, critics, managers, and MBAs at least once a month, and program freely.

Program Recklessly. Ignore "market" requirements (the market usually doesn't know what it wants until it sees it). Go where no programmer has gone before. Add Excel, PageMaker, and RTF compatibility at the end. If ever. If you want to. Make history, not compatibility. Your goal is to create software so great that customers are willing to rekey data, so tell the world to kiss your SCSI port and go for it.

Program for Love. Programming is generosity. You have an insight or know a truth about how a computer can do something. You want other people to share it. So you program. Put your love for people into your program. It will touch people, and all of you will be the better for it. It may even sell — because people are willing to buy love on a disk. (If you want to see love on a disk, look at HAM, from Microseeds Publishing. This little jewel allows you to customize your Apple menu, and

New!

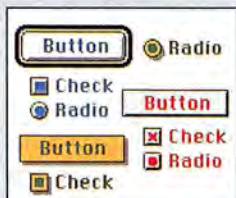
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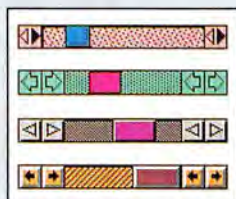
ClickChange Cursors. Replace the 5 factory-issue cursors with fully animated custom cursors. Put some fun into waiting (well, OK—at least ease the tedium). Design your own cursors, and amaze your friends!



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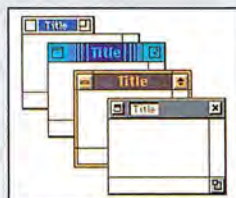
ClickChange Sounds. Set sounds to play when your Mac starts up, shuts down, finishes loading all your INITs, beeps, inserts/ejects disks, and other major events. Import your own sounds and annoy your friends!



ClickChange Scrollbars. Engineered to achieve maximum performance using our exclusive "proportional elevator" and "dubl-arrow" options. And, oh yeah... they look really cool, too.



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ClickChange Windows. The perfect frame to display those fancy new 3D buttons and scrollbars in. Very stylish. Comes in a variety of colors and flavors. Dialog boxes and desk accessory windows get changed too.

ClickChange. \$89.95. Its Easy, its Compatible... and very, very Hip.

- Install by dragging ClickChange into your System folder.
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CIRCLE 23 ON READER SERVICE CARD.

GUY KAWASAKI

it adds a folder to the Apple menu that contains a directory of the items used recently. HAM shows some serious love of System 7 users.)

Program Honestly. Most software is dishonest. When you look at it, you can't believe that a programmer with a triple-digit IQ believes that this is the way things should work. Instead, the software is saying, "This isn't really what I think. The design specs said to do it this way." Or "My boss saw John Sculley demo something that had this kind of interface." Or "My boss saw this feature in an Apple video." Be honest. And be accepted or rejected on what you really believe.

Program to Infect. Great software leaps from a computer and infects people's brains. It makes their fingertips sizzle and their mouse button palpitate. Infection happens immediately or it doesn't happen at all. It won't happen because people try and try to like the program or because a reviewer says it's good. As you program, keep the goal of infection in mind.

Program for Intrinsic Rewards. Programming yields two intrinsic rewards. First, programming helps you understand your feelings better. Nothing forces people to understand themselves better than trying to communicate their feelings. Second, programming increases creativity: The more you use your creative power, the more creativity you will have. (Don't you wish PowerBook batteries worked this way?) No matter how many copies of your program you sell, if you program for intrinsic rewards, you'll reap satisfaction.

Program in the Present. To borrow a Ueland analogy, work like a child stringing beads: one bead at a time, unconcerned about what the necklace might look like with different beads. Ignore the rumors you read in *MacWEEK* about DAL, RISC chips, and cross-platform compilers. Instead, do the best you can with the present. If you wait for the perfect platform and the perfect object-oriented compiler, you may never finish anything. Create a product so great that people won't care about upgrading to the latest gee-whiz what-we've-shipped-but-not-perfected technology.

Program Anything You Want. Ueland quotes William Blake to illustrate this point: "Sooner strangle an infant in its cradle than nurse unacted desires." Ignore the forecast about market size in the year 2000 and the competitive analysis of the viability of various platforms. Tackle anything that fascinates you: a product for a NeXT computer, an Excel killer—even a

Macintosh database program. If your company won't let you do this, then quit. Have you ever met anyone who regretted quitting a job?

Program Microscopically. Take a close look at the software you've created. Does it show attention to detail? A fine eye? Empathy for the user? Forget "patentable, paradigm-shifting algorithms for the '90s," because great software comes down to minute details. Get out your microscope, and program software for mortals.

If you want to see products not programmed microscopically, look at Micro-soft Word or Aldus PageMaker. Don't you love dialog boxes that contain three pop-up menus and nine buttons (Save, Cancel, Apply, Set Default, Apply Set, Apply Default, Default Apply, Default Set, and Default Default) plus four buttons leading to additional dialog boxes?

These products were programmed with a telescope. It must have something to do with being from the Pacific Northwest. Maybe there are spotted owls living in Word and PageMaker, so it's illegal to cut down the number of dialog boxes.

Program When You Are Discouraged. Ueland quotes Van Gogh: "If you hear a voice within you saying: You are no painter, then paint by all means, lad, and that voice will be silenced, but only by working." No one—not Andy Hertzfeld, Bill Atkinson, Steve Capps, or Michael Jordan—ever woke up one day and was great. They make it look easy because they've worked hard. Great programming is opening up a vein and pouring blood onto a disk.

Or Your Money Back

In a rare moment of humility, let me tell you that I haven't done Ueland's book justice. If you are interested in programming or in working with programmers, run, do not walk, to your nearest bookstore and buy *If You Want to Write*. It is one of the few books I have read more than five times. I have so much faith in Ueland's book that if you buy it and it doesn't help you, I will give you your money back. I won't even say that about my books.

Here's the information you need to find it: *If You Want to Write* (ISBN 0-915308-94-0) by Brenda Ueland, Graywolf Press, 2402 University Avenue, Suite 203, St. Paul, MN 55114; (612) 641-0077 or (612) 641-0036 (fax); \$8.95 plus shipping.

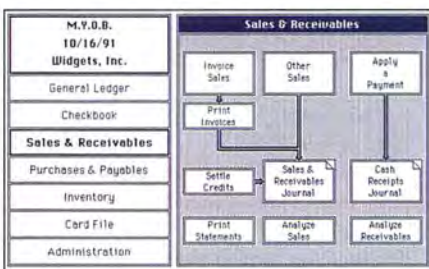
But don't send me your software unless you think Ueland would like it, because my church's hard disks are almost full. ☹

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...helping you Mind Your Own Business

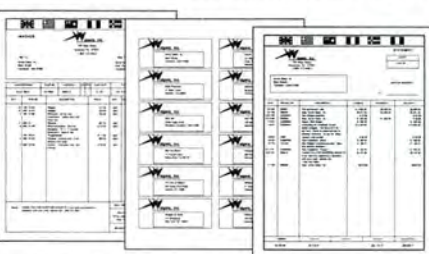
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"M.Y.O.B. really takes advantage of the Macintosh interface... Command buttons... are arranged in a flow chart. As a result, you don't need to be an accountant to know the order in which the command should be used."

MacWorld, November, 1991



"The forms customization feature is highly flexible and lets you change the look and content of printed checks, invoices, statements, purchase orders and mailing labels to give them a unique look and feel."

Mel Male, Reviewer



"Only a few programs make good use of the Macintosh interface. Teleware's M.Y.O.B. has one of the best interfaces."

MacWorld, October, 1991

Only M.Y.O.B. Has:

Easy Interface. Unique graphic windows display every function in clear on-screen flow charts. No need to learn obscure commands — just point and click.

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Analysis Windows.

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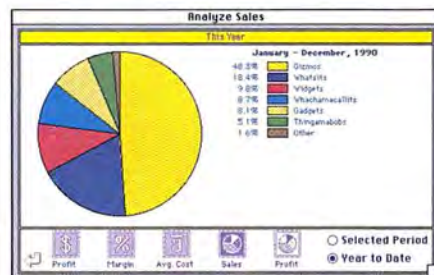
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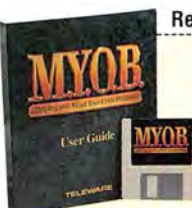
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\$494 Aldus PageMaker 4.2 with PrePrint

PageMaker 4.2 now includes PrePrint 1.5, a color production tool that enables you to enhance and color-correct TIFF images, as well as generate color separations of multi-page documents, including text, illustrations and color photos. Aldus Corp. #4573 ✓✓



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4886	88	5.25"	Syquest	19	1.2	699	8
4876	104	3.5"	Connor	25	1.66-2.5	469	5
4881	105	3.5"LPS	Quantum	17	2.0-4.0	499	5
4882	200	3.5"	Quantum	15	2.0-4.0	849	4
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You're the general manager, the coach, the first-string quarterback. PlayMaker's powerful artificial intelligence feature adapts your coaching strategy to intense game situations. Brøderbund #2983 ✓

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Vette! puts you behind the wheel of America's premier production sports car on the streets of one of the most alluring cities in the world—San Francisco. Spectrum Holobyte #3808 ✓

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The fate of the world depends on your strategic and tactical decisions. Strategic Conquest 3.0 is one of the best military strategy games available. Delta Tao #4083

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Whether hand-held or positioned on your desktop, the KM30 improves your productivity and accuracy. This precision joystick is fully Macintosh ADB compatible. It's great for graphics, business, education and entertainment software. Kraft Systems #1990 ✓

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The Spemin, once the "whipping blobs" of the cosmos, are now the galaxy's most feared race. Your mission is to find out why. Electronic Arts #4346 ✓

Patton Strikes Back \$34

Patton Strikes Back is a radically different strategy game. Stunning graphics and digitized news relics keep you on the edge of your seat. Brøderbund #4998

Falcon V2.2 \$34

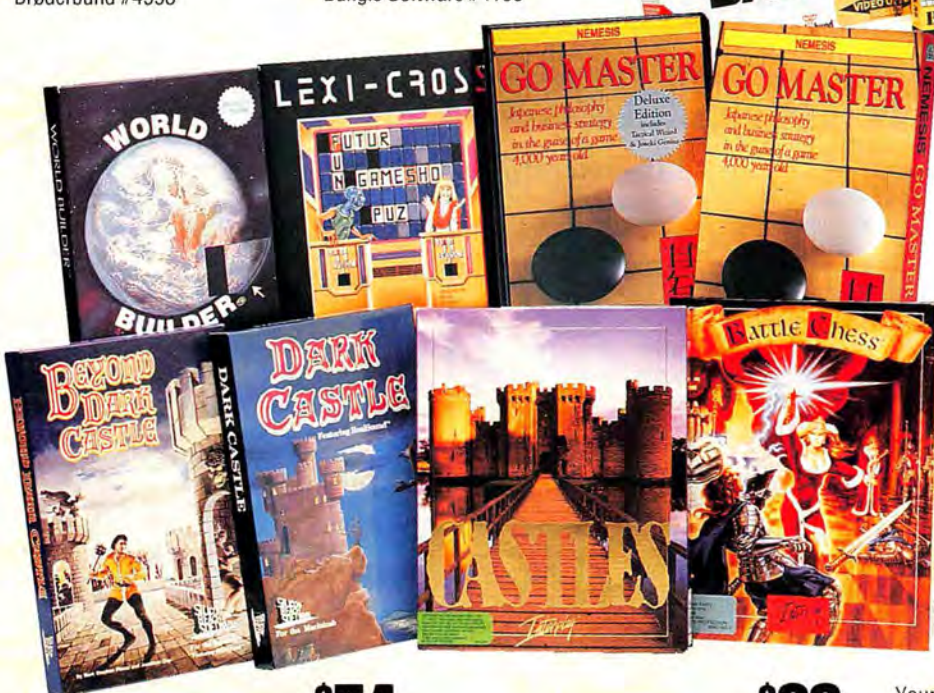
When you climb into the cockpit of the F-16 Fighting Falcon, get set for the "flight of your life." The powerful Falcon takes you streaking across the sky at Mach II. Spectrum Holobyte #1808 ✓

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Take off and land at any of the major airports of the world. Flight Simulator boasts 3-D graphics and runs on both color and B&W Macintosh computers. Microsoft Corp. #4293 ✓

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Join the forces in the gulf in this realistic full-color battle simulation! Bungie Software #4106



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World Builder gives you all the tools you need to make your own professional-quality, stand-alone games, training programs, etc. on the Macintosh. Silicon Beach Software #4600 ✓

Nemesis Deluxe Tool Kit \$79

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Nemesis Go Master begins where Go Junior leaves off. It provides the best teaching and playing program available anywhere. Toyogo #4495 ✓

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Beyond Dark Castle features stunning graphics, full-screen scrolling in the Castle's complex mazes and a flying jet pack you'll use to get over swamps and forests. Silicon Beach Software #1376 ✓

Castles \$34

With Castles you design the layout of your own medieval castle. How high should the battlements be? You decide. Interplay #4953

Battle Chess \$29

The chessboard comes to life with Battle Chess, the first animated chess game. Pieces move and battle over the squares in full VGA graphics with digitized sound effects. Interplay #4134 ✓



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Advanced Gravis' high-scoring MouseStick features advanced optical technology and a dedicated processing unit. Advanced Gravis #2741 ✓

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Sargon, the warlord who ruled the ancient world, challenges you to world-class chess like you have never seen before. Spinnaker #1916 ✓

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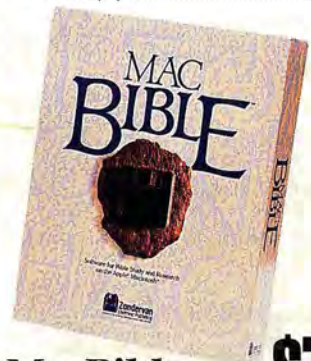
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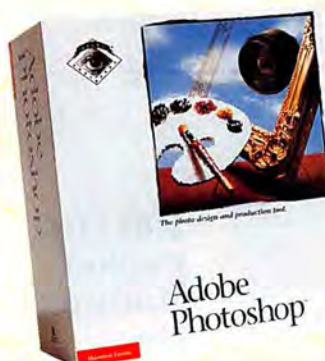


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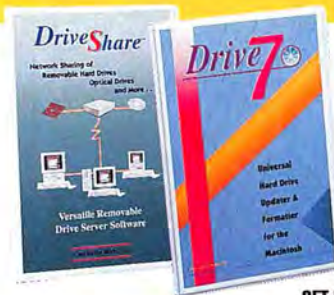
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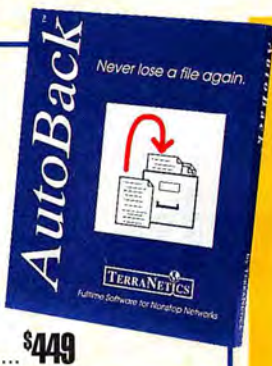
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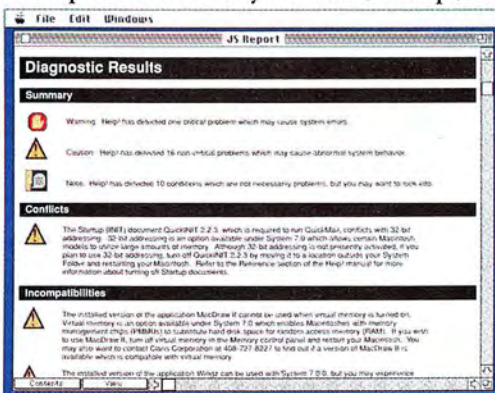




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When Less Is More



You'll find four schemes for compressing data with Apple's QuickTime standard. The one scheme you won't find is the one to watch, though.

Compression is shaping up as a key technology for this decade. Part of what makes Apple's QuickTime quick is its compression algorithms. Compression is one of the gnarly roots of computer technology, with tendrils growing into mathematics and politics and art. It's the kind of technology that invites innovation.

Compression is closely related to encryption. I once published, only half in jest, what could be called the Paranoid's Compression Scheme. By throwing out nearly all vowels and a lot of consonants according to some simple rules, it produces text that is decipherable by a human being fluent in English but that would be difficult to decipher by mechanical means. Just the thing for those who think that the government is running their mail through OCR-equipped computer systems that scan for words and phrases with subversive connotations.

A compression scheme is judged in part by its compression ratio, which is a measure of how much it compresses its input. My Paranoid's Compression Scheme, in combination with other schemes, can achieve a compression ratio of 10:1; that is, it can reduce a 10K file to 1K, which is not bad. But the Paranoid's Compression Scheme is not exactly mainstream computer science. A more conventional compression scheme is null suppression.

There's a generalization of null suppression in QuickTime. Null suppression works with any kind of data, not just text, but it's easiest to explain in terms of text characters. Let's say you've built a table by carefully spacing your data to fall in neat rows and columns. If you transmit that data to someone, you'll be transmitting a lot of spaces along with the actual data. You can reduce the size of the file and eliminate the need for so many spaces (suppress the nulls) by replacing the spaces with a special character that indicates a run of spaces, followed by a number indicating the length of the run. If there are a lot of runs of spaces, you'll save a lot of space. If there are none, you should use some other technique.

Another technique in common use is Huffman coding, in which the most-common characters are assigned the shortest encoding. It's the operative principle in Morse code, in which the most-common letters in English prose, *e* and *t*, are represented by a single dot and a single dash, respectively.

All these techniques serve to define what compression is about: reducing the size of a

chunk or stream of data by discerning and removing redundancy. Null suppression removes redundant characters, whereas Huffman coding removes redundancy statistically.

End Runs

As you can see from the case of null suppression, the effectiveness of a compression scheme depends on the nature of the data. QuickTime's compression schemes are designed to compress images. That's "schemes," plural, because Apple has supplied four compression techniques in QuickTime.

For example, there is the Animation Compressor. Based on one of the most common compression algorithms, it is a good example of how compression algorithms work. The Animation Compressor is an extension to the temporal domain of the standard PICT image format. That is, it not only compresses the images that make up the animation but it also gains some compression from looking at redundancy in the sequence of images.

The Animation Compressor removes redundancy by use of a technique called run-length encoding, or RLE. In fact, the PICT format itself is a compressed format, and it also uses RLE. RLE is just a generalization of null suppression, in which all kinds of runs, not just runs of blank characters, are replaced by a run-length code. RLE can be employed for any kind of data, and the Animation Compressor uses it to compress image data of any bit depth—that is, black-and-white and 2-, 4-, 8-, 16-, and 24-bit color.

RLE is a lossless-compression scheme, meaning that no information is lost in the compression. But there are also lossy-compression schemes, in which some detail is sacrificed to make the image file smaller. I say "image" because lossy schemes are most appropriate for image data, in which a loss of data merely affects the quality or resolution of the picture. In compressing text or numerical data, lossless compression is essential. Lossy compression of sound is difficult.

But QuickTime's Animation Compressor can operate in either a lossless or a lossy mode. In the lossless mode, it simply stores a series of RLE-compressed images, essentially a sequence of PICTs. In lossy mode, though, it stores some but not all of the images, retaining only enough information about the others to regenerate them with some degree of fidelity from the stored images. It does this by storing the differences between frames.

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Reconstructing an image from another compressed image and encoding differences from that image takes some time, which is why another measure of compression schemes, decompression speed, is important. The Animation Compressor is designed for real-time playback and can, under the right set of parameters, play back full-screen images at 30 frames per second.

Imperfect Symmetry

A compression scheme has to include compression as well as decompression algorithms. Decompression simply undoes the effect of compression, but that doesn't mean that there is a perfect symmetry between compression and decompression. One of the other compression schemes in QuickTime demonstrates this.

QuickTime's Video Compressor takes approximately six times as long to compress an image as to decompress it. It can decompress a full-screen image on a Mac IIcx in half a second but takes three seconds to compress it. The Video Compressor approach is designed for compressing 24-bit digitized video for later display. With both spatial and temporal compression—that is, compression of the image and of the sequence—it can achieve a compression ratio between 5:1 and 25:1.

QuickTime's Photo Compressor is based on a compression scheme that's fundamentally different from RLE. It uses the JPEG (Joint Photographic Experts Group) scheme, which is in turn based on a mathematical technique called the discrete cosine transform, which transforms the hue, saturation, and brightness data in an image with two goals: (1) making it easy to discard the least important data, gaining compression at the smallest loss of picture quality, and (2) smoothing the data so that additional compression techniques—such as RLE and Huffman coding—can be applied. The hue, saturation, and brightness information is read off an 8-x-8-pixel grid, which means that, to some extent, JPEG is resolution-dependent.

JPEG is ideal for natural images that have smooth transitions rather than lots of sharp edges. It is a lossy technique, but it can compress a 24-bit image at a compression ratio of 10:1 without discernible loss of detail. On that same IIcx, the same full-screen image would take about ten seconds to compress and ten seconds to decompress. The Photo Compressor is for photographic-quality images.

The fourth compressor supplied with

QuickTime is the Graphics Compressor, which is best for compressing 8-bit still images and movies when the decompression speed is not as important as the compression ratio. But QuickTime allows other compression algorithms to be plugged in, and it is here that we may see some intriguing developments in the future.


One algorithm likely to be plugged in to QuickTime by many third-party vendors is the MPEG (Motion Picture Experts Group) standard. MPEG is similar to JPEG in that it is based on the discrete cosine transform, but it compresses sequences of images temporally and is intended for video compression.

Nature's Own Algorithm

But the cutting edge in compression technology today looks as though it is fractal compression, a technique based on a frankly weird branch of mathematics. Proponents of fractal compression are claiming some very high compression ratios, several times as good as with JPEG.

I first came across the subject of fractals in the context of creating images, not compressing them. Graphics produced by means of fractal formulas have a disquieting similarity to nature. Fractal coastlines and mountain ranges, leaves and branches and blossoms lack the regularity we associate with computer-generated images, but more to the point, they have a kind of regularity we recognize in natural objects. A fractal image is produced by applying a simple rule to a simple image to transform it and then applying the same rule to the transformed image, and so on for as many generations as you like.

Michael Barnsley is one person who has been working intently on fractals and has worked out ways to use them for compression. The general idea is to reverse the process of creating images, but that's easier said than done. Barnsley's company, Iterated Systems, of Norcross, Georgia, has solved the problem and has products on the market. Because fractals use the same rule repeatedly, their essential features are scale-independent, and fractal compression is thus resolution-independent. Without application of any further conversion, a fractally compressed image should be displayable at any resolution.

If fractal compression lives up to its promise, before long you may be able to carry a 100,000-picture photo album of your kids in your pocket. Getting your friends to sit still while you show it to them will be another problem. 

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Jay Nathanson wears a lot of hats. His company – Target Marketing of Richmond, Virginia – is one of the fastest growing small businesses on the East Coast. Ask Jay to explain his success and he'll give you an uncharacteristically succinct response: FileMaker® Pro.

FileMaker Pro wears a lot of hats too. Jay literally built his business with it. He and his lean, mean staff use it to quickly research, quote, present, schedule, ship, label, invoice and generate checks and correspondence for every job. The entire staff can access that data simultaneously – and effortlessly. So almost any question a customer can think of can be answered *while they're on the phone*.

FileMaker Pro even closes Jay's books every month, in 45 minutes. As you might expect, those books look pretty good.

Jay Nathanson is just one of over a quarter-million people who benefit from FileMaker Pro. You can too. To see how call 1-800-729-2292, ext. 20.

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7 REASONS WHY YOU NEED A NEW WORD PROCESSOR.



Because you're ready to see what System 7 can do.

Apple calls System 7 the biggest improvement in Macintosh since Macintosh. And WordPerfect® is now System 7 savvy.

So now (among lots of other new things), WordPerfect will automatically keep track of changes that you (or someone else) might make to imported files (charts, graphics, whatever), and update

your WP documents accordingly. Now, a change made in one place can be a change made in many places. Apple calls it "Publish and Subscribe," and it works between programs on your hard drive, as well as among people on

your network. Publish and Subscribe assures you that your documents will always reflect the latest information available.

And it's just one of the new System 7 tricks that WordPerfect 2.1 has mastered.

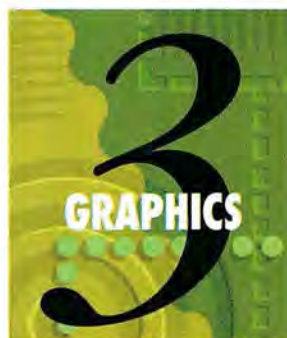


Because WordPerfect does columns better than the Greeks.

Pick a starting point, click on the ruler, and see your text in two columns. Or in three columns. Or five columns. With vertical rules beside or between them, if you like. Drag a guide on the ruler and try *unequal* columns. Highlight text in a box that jumps across columns.

Go crazy with the design, or stick with the tried-and-true.

The point is, WordPerfect gives you formatting options that other word processors don't. And exploring them couldn't be much easier.



Because you'd use more graphics if using them were easy.

WordPerfect not only gives you full control over the placement of graphics in your text, it also gives you a color drawing program for modifying imported artwork (or starting over from scratch) without ever leaving the program.

You can print graphics under your text (as "water-

marks") or on top (as overlays).

You can use the drawing tools to rotate text to any angle that strikes your fancy (something many page-layout programs still can't do).

And WordPerfect gives you 36 border styles and 64 fill patterns — which you can use in any of 256 colors — for highlighting graphics, paragraphs, columns, pages, even blocks of text.



Because a movie is worth who-knows-how-many words.

If a picture is worth a thousand words, what's a movie worth? With WordPerfect and QuickTime, you can calculate it for yourself.



Apple's QuickTime is a new technology that lets you work with digital video and sound as easily as you now work with text and graphics files.

Imagine being able to place (and size) a QuickTime movie anywhere in a document. You could add urgency to a memo with a few well-chosen words delivered "live." Or help an audience visualize your latest brainstorm with a 3-D simulation they can start, stop and replay.

We have a feeling that words can't begin to describe all the ways you'll think of to use it.



Because you get tired of repeating yourself, yourself, yourself.

Perhaps because they've heard it's a powerful programming

language, WordPerfect's macro editor intimidates some people at first. It shouldn't.

It's no more complicated than a tape recorder. Click "record" and it memorizes your keystrokes. Click "play" and it repeats them.

With no more knowledge than that, you can create a WordPerfect macro. And can spare yourself the effort of formatting M-E-M-O-R-A-N-D-U-M, T-O-; F-r-o-m: (and so on) across the top of the page every time you want to fire off a memo, for example.

But simple as recording your own macros can be, we also ship a number of them with the program. For formatting addresses to print on envelopes. Placing "drop caps" at the start of paragraphs. And other jobs you'd rather not do twice.



Because some people work on DOS computers.

You want the word processor that's right for you. If your choice happens also to be the choice of millions of others — with other computers — so much the better.

That's why WordPerfect is such a good choice. Lots of DOS users use WordPerfect. As well as UNIX, VMS and other users. If you ever find your Mac on a network with other computers,

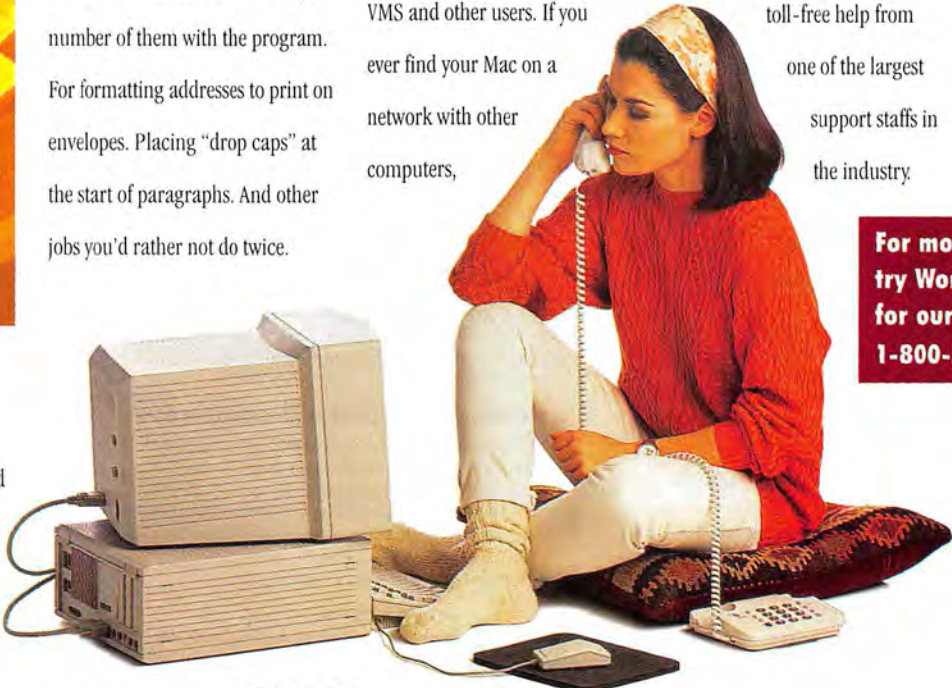
WordPerfect's compatibility can save you a lot of aggravation. Not to mention a lot of reformatting.



Because even if you never call us, it's nice to know we're here.

Like any good Mac program, WordPerfect 2.1 is easy to use. But unlike many Mac programs, you're not on your own with it. You get toll-free help from one of the largest support staffs in the industry.

For more reasons to try WordPerfect, call for our free video. 1-800-526-2296

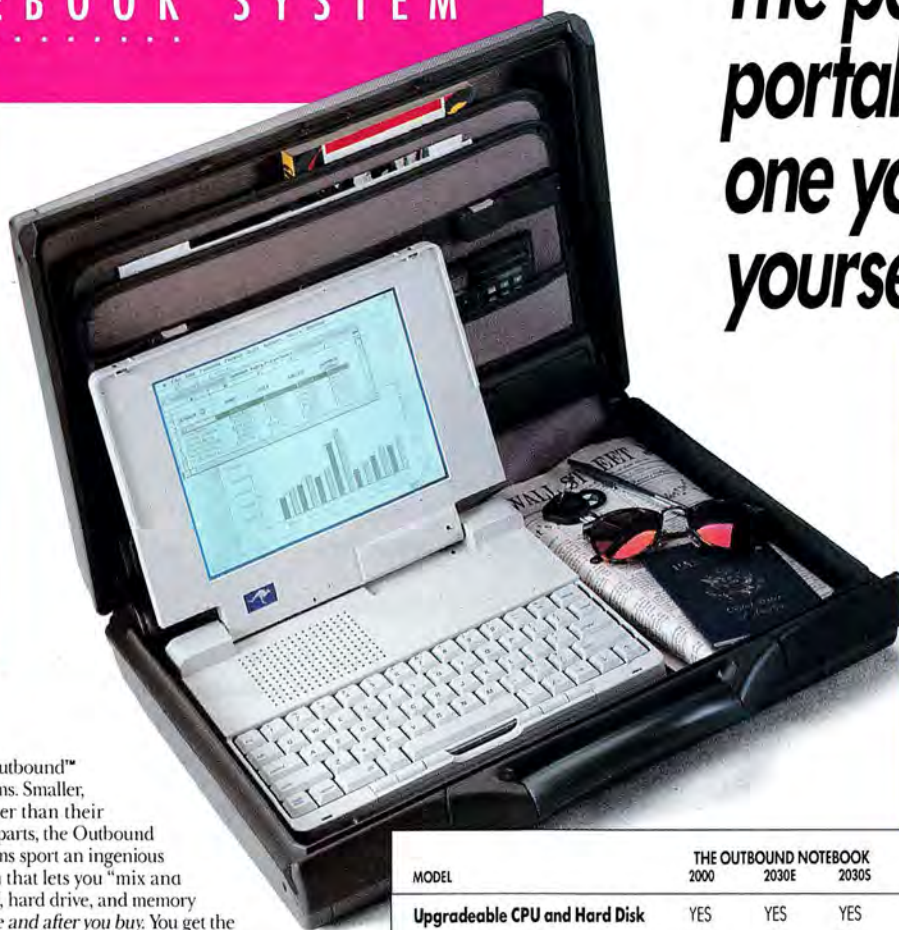


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NOTEBOOK SYSTEM

THE OUTBOUND



Meet the new Outbound™ Notebook Systems. Smaller, lighter and faster than their Apple® counterparts, the Outbound Notebook Systems sport an ingenious modular design that lets you "mix and match" the CPU, hard drive, and memory you want, *before and after you buy*. You get the performance you need right from the start. Then, as your hunger for power grows, you can upgrade your Notebook simply and easily with standard low-cost modules.

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Enjoy Mac compatibility

Your Outbound Notebook is ready for action the minute you unpack the box, because the Macintosh ROM is already installed for compatibility with the thousands of Macintosh applications. Systems come with the memory conscious System 6.0.7 installed, and are completely compatible with System 7. And of course, all models include an internal SuperDrive™ equivalent 3 1/2" floppy disk drive for working with high and low density Mac and MS-DOS diskettes.

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Notebook prices based on direct sales. PowerBook prices reflect published Apple retail pricing. Technical specifications and prices subject to change without notice. The Outbound name, logo and TrackBar are trademarks of Outbound Systems, Inc. Apple, Macintosh and Mac are registered trademarks of Apple Computer Inc. PowerBook and Apple SuperDrive are trademarks of Apple Computer Inc. All other brand and product names mentioned herein are trademarks or registered trademarks of their respective holders.

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MacWEEK Magazine

"Outbound's notebooks are solid machines and deserve serious consideration by anyone contemplating buying a Mac notebook."
Macworld Magazine

"Outbound's new Notebook System has the unique ability to grow along with your requirements—and your budget."
MacUser Magazine

"Innovative touches, a high degree of compatibility, and moderate pricing make the Outbound Notebooks strong competitors with Apple's portable Macs."
Portable Office Magazine

"For me, the Outbound Notebook is the better choice."
BYTE Magazine

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Internal Floppy Standard	YES	YES	YES	No	Yes	Yes
Processor Speed	20MHz	25MHz	33MHz	16MHz	16MHz	25MHz
Maximum Hard Drive Available	120MB	120MB	120MB	20MB	40MB	40MB
Full Size Silent Keyboard and True Notebook Size	YES	YES	YES	No	No	No
Maximum RAM Available	4MB	14MB	14MB	8MB	8MB	8MB
Math Coprocessor	No	Optional	Optional	No	No	Yes
Maximum Silicon Disk Memory (RAM) Available	12MB	50MB	50MB	6MB	6MB	6MB
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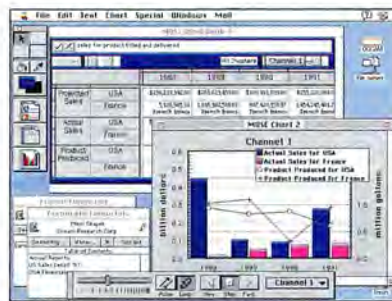


NEW ON THE MENU

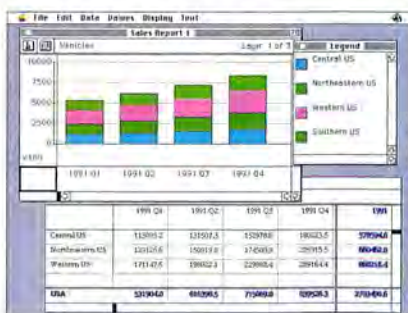
Who ever heard of warding off elves with a horseshoe magnet? That depends on the kind of elf. The ELF ProTech (\$74), from NoRad ([213] 395-0800), reduces ELF (extremely low frequency) magnetic emissions by trapping and absorbing them in a sort of horseshoe magnet made of a custom alloy that wraps around the sides and over the top of a monitor. NoRad says the result drops ELF emissions below the Swedish MPR II standards.

By Russell Ito

The oracles of MIS: Most users' host databases are accessible only through the human oracles in MIS. But a spate of new analysis tools, such as the Eddy Award-winning DataPivot, now promises to give some of the oracles' power back to the people. ♠ **MUSE** (\$695), from Occam Research ([617] 923-3545), combines a spreadsheet metaphor with a relational-database manager and a natural-language core for easy ad hoc analyses. Once you've decided which data you want to explore, you can search for and manipulate it, creating hierarchies, cross tabs, charts, and different views. Beyond that, MUSE's natural-language capability lets users query the database in standard English, as in "What were the sales totals for the Eastern region in the third quarter of the last fiscal year?" Importing data into MUSE is simple enough for most users to do themselves, and they can easily



modify the language dictionary as necessary. ♠ **PowerPlay** (\$695), from Cognos ([617] 229-6600), uses a primarily graphical approach to analysis, letting you drill down through hierarchical graphs instead of viewing hierarchical data. You might, for example, start with a pie chart of your total overhead costs. Clicking on the Benefits slice



would produce a chart of your employee benefits, clicking on Health Insurance would yield a chart of the health-insurance costs, and so on. Because PowerPlay starts from simple text data, it can get its data from practically anywhere, although some data preparation is required. ♠ **The oracles of MIS** are losing their luster. With more-powerful — and -accessible — analysis tools available, users may soon find that the only oracles they need to consult are right on their desktop.

Up to Date . . .

GreatWorks 2.0, Symantec's first upgrade to its integrated package, GreatWorks, supports 8-bit color in every module, includes a drawing layer, and is System 7-savvy. (800) 441-7234 or (408) 252-3570. \$299. ♠ On Cue, ICOM Simulations' popular application/file launcher, has finally been upgraded. **On Cue II**'s features include access to your most recently used files and folders, the ability to launch multiple applications and documents, and five new utilities. (800) 877-4266 or (708) 520-4440. \$99.95. ♠ Radius' latest version of its **Soft Pivot** software lets the Color Pivot monitor display 24-bit color (16.7 million colors), using the internal video circuitry in the Quadras. (408) 434-1010. \$1,549. ☞

Omnis Redux

It's been quite a while since we've heard from Blyth Software, but the developer of Omnis is back with Omnis 7, the successor to Omnis 5. Touted as a

ground-up rewrite (which we are inclined to believe, because Blyth skipped Omnis 6), Omnis 7 promises relational-database developers the ability to create faster and easier-to-use database applications plus full cross-platform compatibility and

compatibility with Omnis 5 applications.

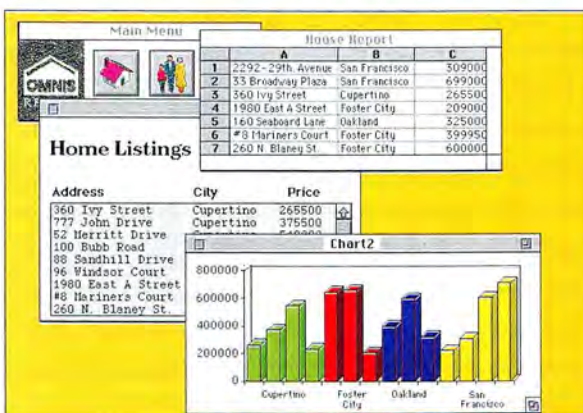
Mac purists who disdained Omnis' previous iterations for not implementing a true Mac interface will be happier with Omnis 7, although they probably still won't be entirely satisfied. Omnis 7 does add such standard Mac interface elements as pop-up lists and hierarchical menus, but it also includes some Windows elements, such as "combo boxes," pop-up lists that include scroll bars.

Users in mixed-platform environments will benefit greatly from the latest version. Omnis 7 databases can support 451 simultaneous users, whether they're using a Mac or a PC with Windows, with full record locking. A database can have as many as 99 open files, and new data types include QuickTime support and list fields.

Omnis 7 includes a utility that lets users create ad hoc reports. Developers can supplement Blyth's report templates with custom templates, and developers will also benefit from a real-time debugger that checks for procedural and logical errors.

Omnis 7 is System 7-savvy, supporting Balloon Help, TrueType, publish-and-subscribe, and Apple events. Developers can also control Omnis 7 applications by using an Apple-events script. All this power comes at a hefty price, though.

Blyth Software, Inc., 1065 E. Hillsdale Blvd., Suite 300, Foster City, CA 94404; (415) 571-0222. Developers' kit, \$1,250; run-time kit, \$250.



Omnis 7, Blyth Software's powerful relational-database environment, offers developers — and users — cross-platform compatibility and an improved Mac interface.

QMS Challenges HP's IIISI

Nowhere is getting more done faster more important than in printing. Hewlett-Packard established a new definition for a business printer with its LaserJet IIISI, and now QMS has responded with its implementation of the same 17-ppm Canon NX engine: the QMS-PS 1700.

The QMS-PS 1700 uses a 25-megahertz Intel 80960CA RISC processor to drive the engine. In addition, the printer uses the same user-selectable resolution (either 300 or 600 dpi) that QMS first introduced in the 815 and 825 MR printers.

As a business printer, the QMS-PS 1700 offers a variety of connectivity options: Adobe PostScript Level 1 (PostScript Level 2 will be available as a ROM upgrade), HP PCL Level IV, and HP-GL 7550 emulations are all resident, and like previous QMS products, the 1700 can automatically sense the appropriate emulation to match the incoming print job and switch to it. The 1700 comes standard with RS-232C, Centronics parallel, and LocalTalk interfaces, and an Ethernet interface is available as a \$995 option.

The QMS-PS 1700 comes standard with 8 megabytes of RAM, and starting in March, QMS is shipping 8-megabyte SIMMs, which enables

memory to be increased to 32 megabytes. All that memory lets the 1700 preserve a page in memory, so if a paper jam causes a lost page in a print job, the 1700 can reprint the lost page, before it flushes the memory.

The QMS-PS 1700 comes standard with two 500-sheet paper trays and software for sequencing the paper supply and for other printing options.

QMS, Inc., One Magnum Pass, Mobile, AL 36618; (800) 523-2696 or (205) 639-4447. \$7,995.



The QMS-PS 1700 packs the same 17-ppm Canon NX print engine as Hewlett-Packard's LaserJet IIISI but with active emulation switching and a choice of 300- or 600-dpi resolution.

Nisus Small

In an age in which the major word processors have gotten bigger, Paragon Concepts has introduced an alternative: Nisus Compact, a smaller version of the company's complete Nisus word processor that should be especially welcome for anyone using a Mac with a limited amount of RAM.

But before you start thinking that Nisus Compact is just a stripped-down version of its parent, here's a surprise: Paragon has actually added some features. Among the additions are a file-management system, a fuzzy-find option that can search on phonetic matches, and XTND support. Nisus Compact also boasts several features that should appeal to PowerBook users, including a small size (400K), a built-in battery indicator and clock, and a thick I-beam for easy editing.

Paragon Concepts, Inc., 990 Highland Drive, Suite 312, Solana Beach, CA 92075; (619) 481-1477. \$150.

SoundEdit Sounds Professional

Now under the MacroMind•Paracomp banner, the MacRecorder, the Mac's first sound-input system, has finally turned pro. The MacRecorder Sound System Pro is the long-awaited upgrade to Farallon Computing's original MacRecorder.

The biggest change to the package is its new SoundEdit Pro software. SoundEdit is now disk-based, letting you record, edit, and play back audio, free from RAM constraints. Because it's disk-based, there is also no limit on the number of audio tracks you can work with, so you can create a multi-track recording that's as complex as

you want. When you mix the tracks, you can control each track's volume level. SoundEdit Pro can accept sound input from any hardware device that supports Apple's Sound Input Manager. And for serious audio nuts, with the addition of an appropriate third-party audio card, SoundEdit Pro can even open and save 16-bit audio samples at rates as high as 48 kilohertz.

MacroMind•Paracomp, Inc., 600 Townsend Street, San Francisco, CA 94103; (415) 442-0200. MacRecorder Sound System Pro (includes MacRecorder hardware), \$349; SoundEdit Pro (software only), \$295.

Notify!: The Mac Pager

If you need to keep in touch with your office and a PowerBook with a modem still isn't enough, Ex Machina's Notify! may be the answer. Notify! is a wireless message center, otherwise known as a pager, that runs on your Mac and works either alone or with your applications to keep you in touch, regardless of where you are.

Running as a stand-alone application, Notify! lets you send messages from a Mac; the recipients get the full messages on a numeric or alphanumeric pager. After entering and addressing a message in Notify!, you send it, via Notify!, to a local paging service that passes the message to the recipient's pager. Using Notify!, the recipient gets a full message instead of just a phone number.

Notify! is a System 7.0 extension that fully supports Apple events and UserLand Frontier scripts, so other applications can also send messages directly to your pager. Some of the products expected to use Notify! soon are 4th Dimension, QuickMail, Microsoft Mail, MicroPhone, EtherPeek, LocalPeek, Net Watchman, and WordPerfect Office.

Notify! is available in both single-user and network versions. The network version lets several users send their pages through a single server on the net.

Ex Machina, Inc., 45 E. 89th Street, #39A, New York, NY 10126; (800) 238-4738 or (212) 831-3142. Personal version, \$149; network version, \$399.



Hewlett-Packard's HP DAT Macintosh Backup Solution puts the rugged DAT drive the company shipped as part of its rack-storage system onto the desktop. The 4-millimeter DAT drive can store as much as 2 gigabytes on a single 90-meter DAT tape, and it comes with Retrospect Remote.

HP's Stand-Alone DAT

Having already introduced a DAT drive in its minirack storage system, Hewlett-Packard has decided that it's time for its DAT to go it alone. The HP DAT Macintosh Backup Solution (a singularly catchy name, eh?) is the company's first stand-alone, 4-millimeter DAT product for the Mac.

Because the drive offers a capacity of 2 gigabytes on a single 90-meter DAT tape, HP sees it primarily as a network device. With that in mind, it bundles the drive with a ten-user version of Dantz Development's Retrospect Remote backup and archiving software.

Hewlett-Packard Co., 19310 Pruneridge Avenue, Cupertino, CA 95014; (800) 752-0900. \$3,295. 

NewsLine

Reports and Analysis

Apple Plans Consumer Products

LAS VEGAS, NV — Having made a big splash in Las Vegas last October, when it introduced the PowerBook and Quadra lines, Apple Computer returned to the desert in January to outline a new product direction. Speaking at the Winter Consumer Electronics Show, Apple chairman and CEO John Sculley announced that Apple would enter the consumer-electronics market by the end of 1992. Sculley characterized the move as the third stage in an ongoing effort to broaden Apple's market presence.

The first products, expected to be available by Christmas, will include two lines of CD-ROM-based Macs, one of which will be aimed at consumer-electronics buyers and the other at traditional computer users. Both products will make use of QuickTime. Sculley predicted that such products will entice new users to enter the Macintosh market and then upgrade to more-powerful Macs.

In addition, Sculley announced plans for an entirely new line of digital products. Coining yet another TLA (three-letter acronym), Sculley described a collection of tightly focused PDAs (personal digital assistants) that might include electronic books and organizers, multimedia players, and video telephones. Sculley pointed to Apple's work in telephony and wireless research as an indication of the company's interests. To help get all these products to market, Sculley announced that Apple was seriously negotiating with several Japanese manufacturers. The Japanese firms will work with Apple as partners in producing Apple-brand products as well as devices that will use Apple's software technologies but appear under the Japanese companies' names. Sony is widely believed to be at the top of Apple's list of Japanese partners.

Apple's System 7 Tune-Up

CUPERTINO, CA — Apple Computer has shipped System 7 Tune-Up, a free System 7 fixer that makes it easier to use System 7 in low-memory configurations and boasts improved print performance. The package includes new StyleWriter and LaserWriter drivers and fixes a known bug in the File Sharing extension. Tune-Up is available from user groups and BBSs or direct from Apple: (800) 947-5176.

WORD PROCESSING

Microsoft Word for the Macintosh 5.0

Microsoft succeeds at smoothing most of the rough edges from its popular word-processing program.

Users of Microsoft Word for the Macintosh 5.0 may not notice any improvements in the appearance of documents they create with the Mac's most popular word-processing program, but they will notice that creating those documents is faster and easier. New commands and tools plus enhancements to existing features add up to a finely tuned word-processing program that's more powerful and intuitive to operate than ever before.

Start Making Sense

Veteran Word users will find that version 5.0 works more intuitively than previous versions. New menus and commands make common tasks easier and add new talents to the program. The Insert menu, for example, provides a fast and convenient way to place document

elements such as tables and graphics.

Version 5.0 enhances Word's familiar paragraph-formatting ruler with a new Ribbon bar, which sits atop the ruler. The Ribbon bar makes it easy to quickly change character formats; access Word's new drawing module, which lets you create simple graphics on the fly; show and hide invisible characters; or change the number of columns in a section — each with a single point and click.

Redesigned dialog boxes with pop-up menus make a variety of options less confusing. For example, if you want to specify a paragraph's leading at 14 points, regardless of how large the type is, you no longer have to enter -14. You can simply select Exactly from the new pop-up menu and enter 14.

Even more impressive is Word 5.0's addictive shortcut for text editing: You

can simply drag a selection to another location instead of using the two-step process of cutting and pasting the text. We'd like to see this feature extended to moving columns in tables and dragging selections between windows.

Word 5.0 also circumvents arcane keyboard combinations and the Key Caps DA by letting you select any character in the current typeface's character set from a table, using the Insert Symbol command. This version also takes much of the guesswork out of using keyboard command equivalents by making them more consistent with Mac conventions: Command A now selects all, for example, and Command B creates bold text.

You can access files quickly from version 5.0's File menu, which provides a handy list of the four most recently opened files. Another welcome addition is case conversion. You can specify a range of text to be all uppercase, lowercase, "title case" (initial caps), "sentence case" (only the first word of each sentence is capitalized), or "toggle case" (which changes the case of selected words from lowercase to uppercase and vice versa).

Word 5.0 has increased the 128-point type limit of previous versions to 16,383 points, which should be more than ample for most users. In addition, font collectors will be happy that the much reviled restriction on the number of fonts in the Font menu has finally been lifted. And last but not least, the magnifying-glass tool has been returned to the Print Preview window, so you can zoom in to take a closer look at a document.

There's one caveat for those who rely on Word to work smoothly with PageMaker: We encountered numerous problems pouring Word 5.0 documents into PageMaker layouts. This incompatibility is apparently due to changes in Word 5.0's file format, although the previous version of Word has no trouble opening documents created with Word 5.0. As we went to press, Aldus was putting the finishing touches on a special filter to combat this problem. The filter should be available by the time this review appears.

To date, the only way around this problem is to open Word 5.0 documents in Word 4.0 and save them in RTF format. Saving in RTF format within Word 5.0 is not advisable, because the document will lose such characters as bullets, em dashes, and smart quotes when Word 5.0-generated RTF files are opened with Word 4.0 or PageMaker.

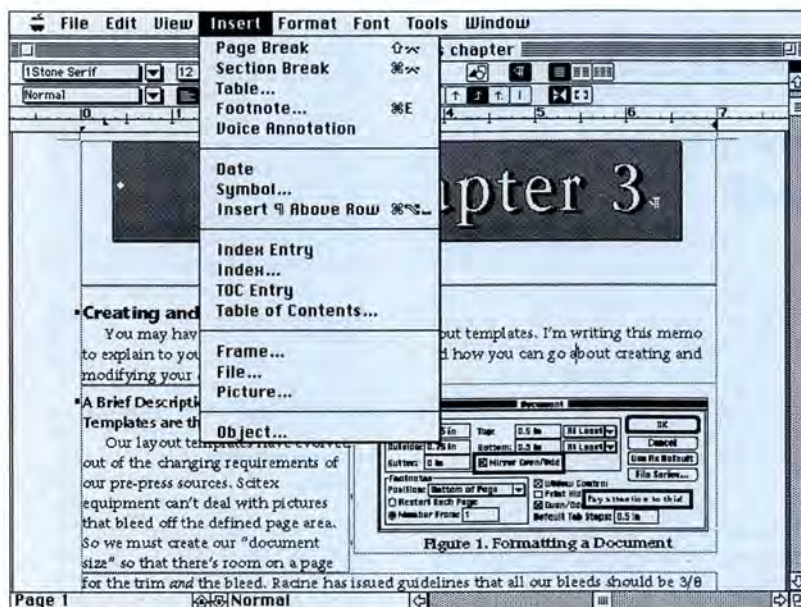
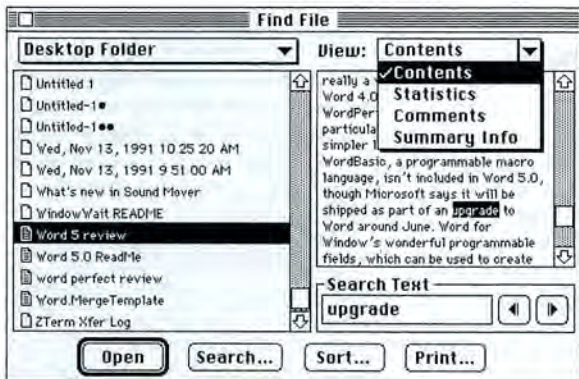
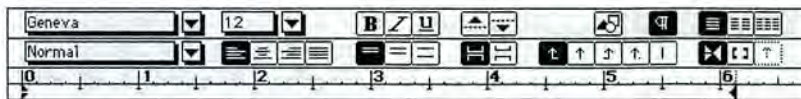


Figure 1. Formatting a Document

Microsoft has done an excellent job of simplifying common tasks in Word 5.0. For example, the Insert menu, shown here, lets you place elements such as graphics, tables, and line breaks directly into documents.



The Ribbon bar (top), which sits atop Word 5.0's ruler, provides one-stop character formatting and column selection. The new Find File feature (left) is fast and powerful: For text searches, you can view the contents of a file and copy text to the Clipboard without ever opening the file.

command, which is really a slight repackaging of Word 4.0's Position command. WordPerfect and Nisus, on the other hand, each offer more-powerful and easier-to-use layout capabilities. However, Word's ability to collapse an entire document into an outline, basing the outline structure on headings and sub-headings, is a useful feature that's unmatched in any other word-processing program.

Word 5.0 offers full support for System 7 features such as publish-and-subscribe, TrueType fonts, Apple events, and Balloon Help. It also lets you embed objects from other programs, such as Excel. Embedding uses no edition files but actually embeds part of another application's document within the Word file. Word also emulates Windows' Dynamic Data Exchange with its Paste Link command, which can create a direct link between a Word document and another file, such as an Excel spreadsheet, without requiring an edition file.

The Bottom Line

If you're considering purchasing Microsoft Word for the first time, version 5.0 is an excellent value. A host of new features makes it easier to learn and use than previous versions. The addition of powerful new tools, such as the built-in grammar checker and thesaurus, combined with Word's unique outlining capability, make it the Mac's premier writing tool. Equally impressive is the new Print Merge Helper, which makes mail-merge as simple as selecting a few menu choices.

However, if you're a Word 4.0 user who's grown accustomed to that version's vagaries and you don't need specific System 7 features such as publish-and-subscribe, you may be better off setting aside the upgrade fee until Word undergoes another major revision.

— Eric Taub

The Write Tools

In addition to making common tasks easier and more accessible, Word 5.0 includes several powerful new tools. One of the most impressive is the Find File command, which can quickly compile a list of files on any volume that meet user-defined criteria. Because Word 5.0 lets you attach title, subject, author, version, and keyword information to each file summary, you can base searches on the contents of any of these fields as well as search for text that appears within documents. You can limit searches to only those files that Word can open, or you can search for other file types. Once Find File has compiled a list that meets your search criteria, you can view information, such as file statistics, about the files. If the file is one that Word can open, you can view its contents as well as copy text to the Clipboard, without ever opening the file.

New integrated writing tools add to version 5.0's versatility. The powerful built-in grammar checker can identify sentence structures that violate as many as 33 rules. The excellent built-in thesaurus lists antonyms as well as synonyms for selected words. The enhanced spelling checker automatically supplies suggestions, looks for misspellings based on word phonetics, and detects duplicated words and punctuation marks as well as words that run together.

Anyone who has ever struggled with Word's formula commands for setting mathematical equations will appreciate the new version's Equation Editor, a pared-down version of Design Sciences' popular MathType. It sports a graphical interface and uses Microsoft's Object

Linking and Embedding, so you can place equations and edit them directly within documents without cutting and pasting.

Word 5.0's Print Merge Helper greatly simplifies mail-merge. When you select the Helper, a ribbonlike strip appears at the top of your open document's window. The strip provides pull-down menus with selections that can automatically insert field names and conditional statements into documents, which eliminates the cumbersome task of typing angled brackets around fields. If you've never created a table or a database for mail-merge, the Helper can create a blank data file for you, link it to a document, and add the proper merge syntax.

Although Word's style sheets, outlining, and page-layout features remain virtually unchanged in the new version, a few new tweaks are worth mentioning. You can now specify custom borders and screen fills for paragraphs and table cells, so you can create text on a gray background without importing graphics or embedding PostScript code. You can also set borders (but not fills) for individual picture boxes.

The Insert Picture command lets Word 5.0 import PICT, EPS, and TIFF graphics directly, without use of the Clipboard. However, importing graphics is sometimes problematic, because Word's file converters can be very slow and occasionally quit before finishing their task.

In general, when it comes to style-sheet management, Word can't compete with WordPerfect's powerful capabilities. Although it's possible to create sophisticated layouts with Word, it's still not easy or intuitive, despite the addition of the Frame

Get Info

Microsoft Word for the Macintosh 5.0

1111 1/2

Published by: Microsoft Corp.,
One Microsoft Way, Redmond,
WA 98052; (206) 882-8080.

Version: 5.0.

List Price: \$495; upgrade, \$129.

GRAPHICS & DESIGN

SuperPaint 3.0

Improved color capabilities and a cleaner interface put SuperPaint back on track.

With the release of version 3.0, SuperPaint restores its reputation as a versatile integrated painting and drawing environment that won't cost you an arm and a leg. Although the program's original version set a milestone in Mac-graphics history by combining bit-mapped painting with object-oriented drawing, the program lost its way with version 2.0, which was hamstrung by a dismal color implementation. SuperPaint 3.0, however, addresses the entire spectrum of Mac systems — from black-and-white to 24-bit color — and offers improved tools for color handling.

Less Distress

Not only did the previous version of SuperPaint have an 8-color limit but you also had to use a separate mode to view colors. Even more distressing, you couldn't edit drawings in color mode. Version 3.0, however, features full-fledged color support for 8-, 16-, and 24-bit operation. You can define colors by using the RGB, HSB, or CMYK color models, and you can save custom palettes and edit artwork in color. Because the bit depth of documents is defined independently of your hardware, SuperPaint 3.0 lets you edit 24-bit images on 8-bit Macs. The program approximates colors beyond your working palette, using excellent dithers, so even an 8-bit Mac can access 16.8 million colors.

SuperPaint 3.0's redesigned interface makes it less visually cluttered, more logically arranged, and easier to use than previous versions. This version continues to use two smoothly integrated layers, one for drawing and one for painting. Each layer has a main palette brimming with tear-off subpalettes. Pop-up boxes segregate tools by function, a welcome approach that eliminates the need to scroll through the Tool palette to find the right tool. Tools available from the painting and drawing layer appear in one box, paint-only tools are located in another, and all selection tools are stored in a third.

The line-width selections, major usurpers of Tool-palette space in the previous version, now appear in a pop-up box on

the Line & Fill palette. This palette also contains pop-up boxes for color, gradient, texture, and pattern selection as well as the transfer modes governing the interaction of fills. A third palette keeps your 12 most recent fills available for easy access, and a fourth displays drawing coordinates. Each of the four palettes can be toggled on and off.

Like version 2.0, SuperPaint 3.0 uses keyboard command equivalents to facilitate basic functions such as cut-and-paste and zoom operations. The new version goes one step further, however, by incorporating hot keys that let you access palettes and a variety of individual tools, each with a single keystroke.

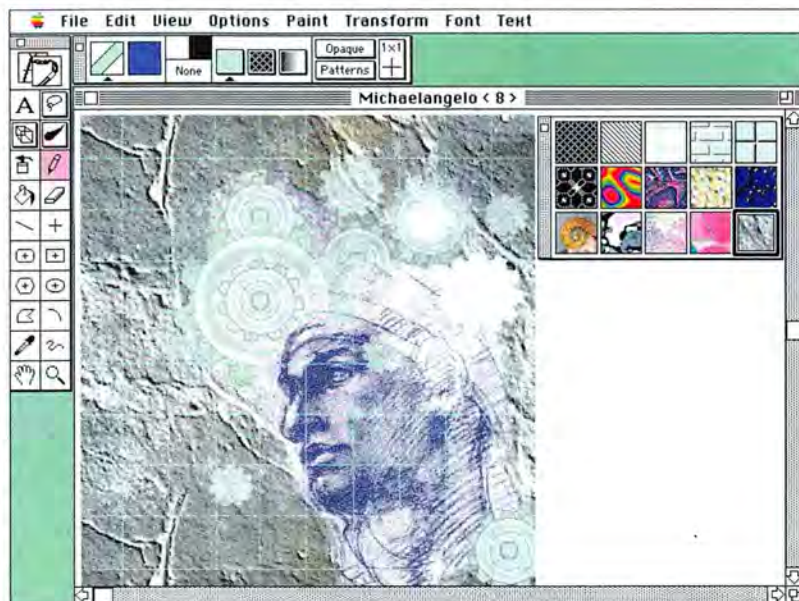
SuperPaint continues to add to its impressive collection of special-effects tools. New with version 3.0 are textures and gradients you can apply to any object in the drawing layer as well as to text, using any tool from the painting layer. Textures can exist as bit maps, objects, EPS files, or SuperBits (high-resolution editable bit-

mapped objects), and the program places no restrictions on their size — that's determined by the amount of memory in your Mac.

The program saves textures and color palettes in a special Pouch folder, but custom gradients, which can use as many as 256 shades, are saved with documents. You can make any additions to the default gradient palette by defining gradients without opening a document. The ability to save them independently to the Pouch, where all documents could access them, would be a welcome improvement.

Version 3.0's straightforward and easy-to-use masks are a wonderful addition to SuperPaint. In combination with new controls for color balance, brightness, and contrast — and added to the previous version's Lighten, Darken, and Diffuse commands — they give SuperPaint the ability to do basic image processing. You can also import scanned photos as SuperBits and edit them at high resolution for printing on anything from LaserWriters to Linotronics.

Although SuperPaint's chief strengths lie in the program's painting abilities, the drawing layer is quite adequate. It can't compete with the precision of pricier drawing programs such as Canvas or Illustrator, but it does provide an excellent Bézier tool as well as an auto-trace capability that transfers bit maps to the drawing layer. Unfortunately for technical



SuperPaint 3.0 features enhanced color support and includes 20 new textures. It also lets you add your own textures. The one shown here was created from a scanned image.

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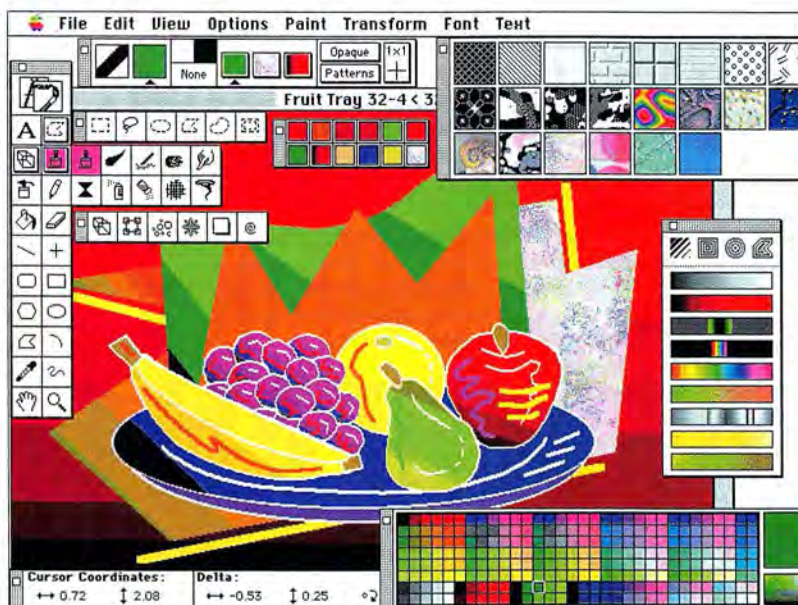
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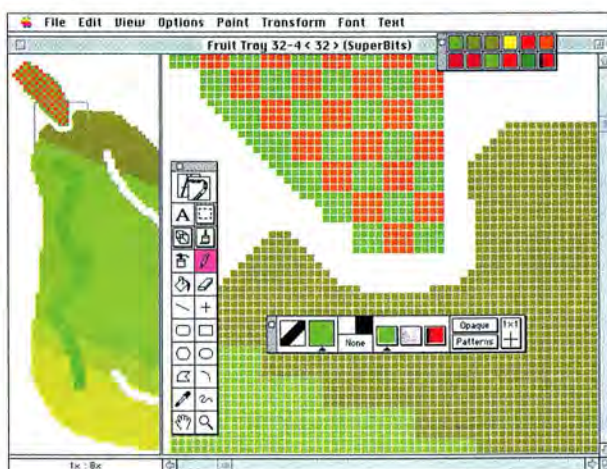
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CIRCLE 52 ON READER SERVICE CARD.



The new version of SuperPaint sports a redesigned interface loaded with pop-up boxes and tear-off palettes.



You can create editable bit maps in SuperPaint 3.0's drawing layer with SuperBits. In this 300-dpi image, each Mac screen pixel is represented by a matrix of 4 x 4 dots.

illustrators, the program's Replicate command cannot distribute objects around fixed points.

SuperPaint 3.0 supports the Paint, EPS, TIFF, PICT, startup-screen, and SuperPaint 1.0 formats. The new version uses a proprietary file format that is more efficient than the PICT format used in version 2.0: The files are smaller, so they're faster to read and write.

The program's text handling is excellent, no matter which layer you're working in. However, SuperPaint's single-level Undo is a drawback, as is its lack of a way to define selections by matching colors. We'd also like to see a magic-wand-like tool that lets you select a range of colors

or make selections that remain active during other operations. Reshapable palettes for the best use of screen space would also be useful.

According to the manual, SuperPaint 3.0 runs on any Mac equipped with at least 2 megabytes of RAM. If you're running System 7, however, 4 megabytes is the actual minimum configuration. SuperPaint is System 7-compatible, but it doesn't support specific System 7 functions such as publish-and-subscribe and Apple events. The manual is an informative reference, but its tutorial is weak. Fortunately for novices, the program is a snap to learn.

SuperPaint runs flawlessly, but it's no speedster. On a IIx with a SuperMac

Spectrum/8•24 PDQ accelerator board, painting functions and dynamic transformations operated briskly. Other operations, such as saves, seemed abnormally slow, though. SuperPaint uses virtual memory to deal with large files, which slows everything down. The program exploits RAM as much as possible, however, so performance will benefit from a hefty allotment. If you plan to work with 24-bit color, we recommend at least a 5-megabyte hard-disk partition and 10 megabytes works wonders.

SuperPaint seems an obvious choice if you're planning to upgrade from a black-and-white Mac to a color machine. We were disappointed by the program's performance on a Mac Plus with a 2.5-megabyte partition. The painting operations and transformation calculations were fairly quick, but general response, as in the case of fill selections and saves, was as slow as molasses. If you want only black-and-white painting capability, Studio/1 and Amazing Paint are more nimble and less expensive. At more than 1 megabyte, SuperPaint 3.0 is roughly six times the size of Amazing Paint and twice as large as Studio/1.

The Bottom Line

SuperPaint 3.0 is a vast improvement over the previous version, but it's not the final word in painting/drawing software. It doesn't try to match features with high-end painting programs such as Studio/32 or PixelPaint Professional, nor do its drawing tools compete with those in Canvas or Illustrator. It is, however, an excellent, easy to use, all-purpose graphics tool that's priced competitively. Moreover, with its support for 1-, 8-, 16-, and 24-bit color, SuperPaint is versatile enough to grow with you if you're a Classic or LC user looking to upgrade to a more powerful Mac.

— Carlos Martinez

Get Info

SuperPaint 3.0

|||||

Published by: Silicon Beach Software (a subsidiary of Aldus Corp.), 9770 Carroll Center Road, Suite J, San Diego, CA 92126; (619) 695-6956.

Version: 3.0.

List Price: \$199.

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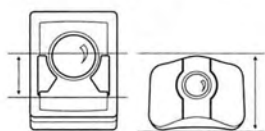


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PERSONAL-INFORMATION MANAGERS

Intouch and TouchBASE 2.0

Speed and more search options distinguish the network-ready TouchBASE address-book manager from rival Intouch.

If your organization is looking for a way to share a database of names and addresses over a network, look no further than Intouch and TouchBASE. Both programs can store the bulk of your company's names and addresses on a server while doing double duty as personal-address-book managers that allow users to store personal contacts locally. Of the two, Intouch has the superior architecture for network use, but we found that its general feature set couldn't compare with that of TouchBASE.

Intouch

Intouch is a DA that provides two fields per record: a name/address field and a phone number/notes field. This mix of multifield and single-field approaches works well, and the program's intuitive interface is a real plus. However, as with single-field databases, for most efficient searching, it's best to impose a structure on data entry. For fast dialing, for example, it's best to place phone numbers at the beginning of the second field. Intouch's phone-dialing options are many and powerful, and they should satisfy most users' requirements.

Intouch lets you search on any data entered in a record. Data entry is easy, and import and export procedures are straightforward. The only difficulty we encountered was in exporting to multifield address managers.

Intouch's most serious limitation, however, is that it displays only a single record at a time, so you can't select sets of records. When you search the database, you must issue a command to move from one record to the next. That's inefficient and slow and a decided drawback if you need to work with subsets of your address list.

In fact, Intouch's overall speed is a disappointment. With our test database of several thousand records, Intouch's search speed was noticeably slower than that of TouchBASE.

One of the strengths of Intouch is its

excellent envelope-printing capabilities. You can place graphics in return addresses, the program supports multiple return addresses, and there's a full bar-coding option. Other printing options, however, aren't as impressive.

The network version, Intouch Network, supplies a server application that can run in the background on any machine on the network. Our test showed that because the software is client/server-based, all searching occurs on the server machine, which optimizes performance and eliminates unnecessary network traffic. Advanced Software also provides two-level password protection for the Intouch server database.

TouchBASE

Like Intouch, TouchBASE is a DA, but it features several advantages over its competitor. Its multifield data-entry screen provides built-in artificial intelligence that

eases the task of data entry. For example, the program automatically capitalizes the first letter in the first- and last-name fields. The program also supplies more-flexible search capabilities and options than does Intouch.

TouchBASE's search speed is impressive. Relative to other address-book programs, TouchBASE is considerably faster than Intouch and Address Book Plus but a tad slower than Dynodex and Quick-DEX II. And whereas the first version of TouchBASE was infamous for the size of its databases, version 2.0 is far more conservative with file size. Phone dialing is easy, and the program provides a complete range of options.

TouchBASE's printing capabilities provide just about any option you can think of, including envelope printing, fax cover sheets, labels (it has lots of predefined templates), double-sided address books, single records, and listings. Some of the fancier print operations are far from speedy, but they get the job done.

For network use, TouchBASE databases must reside on a dedicated server. As a multiuser program, TouchBASE performs well.

Special features include Balloon Help, the cheapest price around for FiloFax and Dayrunner paper (\$9.95/100), and the ability to export data directly to Sharp Wizard hand-held computers.

The screenshot displays the TouchBASE 2.0 interface. At the top, a window titled 'Sample.Data' shows a list of contacts with columns for 'Entire Name', 'Company', 'Entire Address', and 'Phone 2'. A search menu is open, showing options like 'Check Box Search...', 'Date Search...', 'Quick Search...', 'By Company...', 'By First Name...', and 'By Last Name...'. Below the list, a 'Full Search...' button is visible. To the right, a window titled 'TouchBASE.Data' shows a detailed view of a selected record for 'Mr. Alfred E. Neuman'. This window includes fields for Name, Company, Title, Address, City, State/Zip, Country, Phone 1, Phone 2, Fax, and Notes. It also features a 'Marked' checkbox, a 'Custom' list with various options, and a 'Notes' field with a clock icon.

TouchBASE is a DA that can serve as both a personal-address-book manager and a shared network database of names and addresses. You can opt to view your data in list form or as individual records in a Rolodex-style format. The program's multicriteria search options are among its chief strengths.

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Intouch sports an easy-to-use interface and superior network architecture but suffers from lackluster search capabilities and speed.

Both TouchBASE 2.0 and Intouch are System 7-compatible, although neither supports System 7 features such as publish-and-subscribe and Apple events.

The Bottom Line

We commend Advanced Software for Intouch's client/server architecture, which is a real plus for network use. But when it comes to essential features such as search capabilities and speed, Intouch can't compete with TouchBASE. TouchBASE's multicriteria search options make it a more powerful address-book manager, and its speed comes close to matching that of Dynodex and QuickDEX II, two other address-book programs renowned for speed but lacking the network option offered by TouchBASE and Intouch. Whether for network or personal use, TouchBASE is an excellent tool for handling large address-book databases.

— Steven Bobker

Get Info

Intouch

Published by: Advanced Software, 1095 E. Duane Avenue, Suite 212, Sunnyvale, CA 94086; (800) 346-5392 or (408) 733-0745.

Version: 1.1.
Price: \$69.95.

TouchBASE

****½

Published by: After Hours Software, 5636 Van Nuys Blvd., Suite B, Van Nuys, CA 91401; (818) 780-2220.

Version: 2.0.
Price: \$125.

PAINTING & IMAGE EDITING

Aldus Gallery Effects

Aldus' filters give artists and dilettantes alike a shortcut to a wide variety of stunning image effects.

Instant gratification is the name of the Aldus Gallery Effects game. The package, aimed at artists and desktop publishers, consists of a wide variety of filters that gives scanned graphics the look of natural, or nonelectronic, media. They include various brush strokes, watercolors, charcoal, spatter paint, fresco, poster edges, craquelure (which looks like a rough tiled-plaster surface), chrome, and graphic pen (a high-contrast style especially well suited for laser-printer output).

The GE filters are also capable of some esoteric special effects such as chrome and mosaic, and they can do strange things to existing digital artwork. To extend the filter's abilities even further, users can combine them to create bizarre visual effects that look nothing like natural media.

Filter This

The GE filters can be used in conjunction with Digital Darkroom, SuperPaint, or Photoshop. For those who don't own one of those applications, the package also includes a stand-alone application and a

DA that supply simple brightness, contrast, and color-correction controls.

Using Gallery Effects is simple: You can apply the filters to an entire document or a selected area. The maximum size of the area is determined by the application. For example, Photoshop allows the filters to be applied to large images, because it has native virtual-memory abilities, whereas the GE application and DA are limited to available RAM. Special selection modes such as feathered selections and alpha channels found in supported applications are fully compatible with GE.

GE's interface is impressive: When you invoke a filter, you're presented with a thumbnail display of the document or selected area as well as various controls, which differ depending on the filter. GE encourages experimentation by allowing you to select a subsection of a thumbnail and then preview the effects, and it lets you try different settings without processing the entire image.

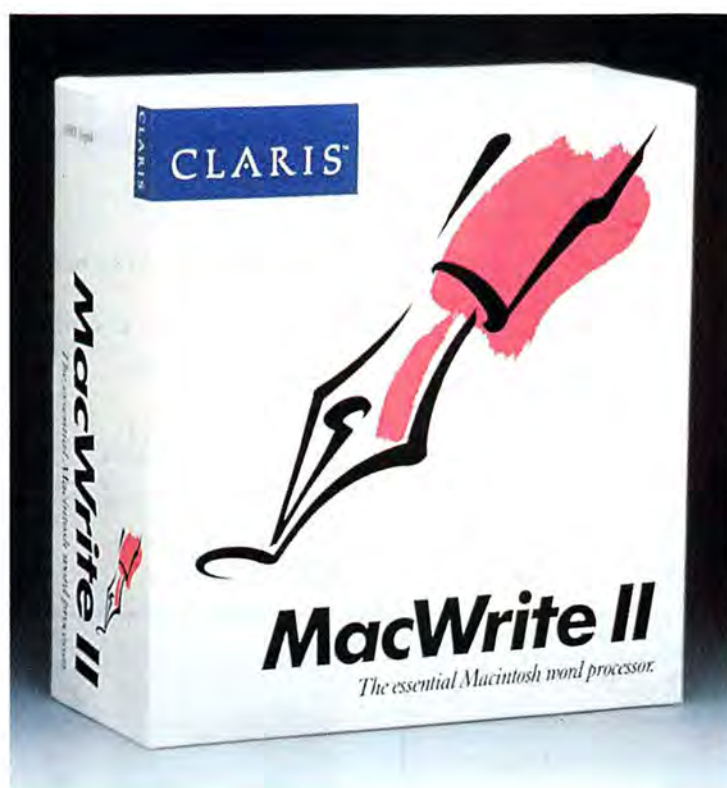
When you're happy with an effect, you can apply it to the entire document or just to the selection. You can change each



With Aldus Gallery Effects, you can create stunning visual effects easily and quickly by applying filters to scanned images and original artwork. Here, moving clockwise from the lower left corner, are the Watercolor, Smudge Stick, and Craquelure effects. The final effect is an example of multichannel filtering, which we created by using GE from within Photoshop (Graphic Pen applied to red channel, Smudge Stick applied to green channel, and Chrome applied to blue channel).

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- Fox Software**
5572 ⑦ FoxBASE +/Mac 2.01 289.
- ★ **Franklin Software ... 30 day MBG**
7070 Language Master 2.0 45.
- ★ **Good Software ... 30 day MBG**
2527 ⑦ REM's Property Manager 3.01 399.
- ★ **Individual Software ... 30 day MBG**
9640 ⑦ Resume Maker 1.0 26.
- Informix**
4955 ⑦ Wingz 1.1A 245.
- ★ **Intuit ... 30 day MBG**
2507 ⑦ Quicken 3.0 42.
- ★ **Kaetron Software ... 30 day MBG**
1091 ⑦ Flow Chart Express 93.
8941 ⑦ TopDown 3.0 199.
- ★ **Lotus Development ... 60 day MBG**
3606 ⑦ 1-2-3 for the Mac 329. 3604 Upgrade 89.
- ★ **Mainstay ... 30 day MBG**
7718 ⑦ MacFlow 3.54 185.
- ★ **MECA ... 60 day MBG**
2796 ⑦ Managing Your Money 4.0 99.
- ★ **Microlytics ... 60 day MBG**
9729 ⑦ Strunk & White's Elements of Style . . . 34.
7820 ⑦ Random House Encyclopedia 1.0 . . . 68.
7506 ⑦ Inside Information 1.0 68.
- ★ **Microsoft ... 30 day MBG**
2572 ⑦ Schedule Plus 1.0 125.
2884 ⑦ Works 2.00E 155.



Chena Software
1594 **Fair Witness 1.1—1991 MacUser Editors' Choice Award for Best Organizational Tool. It's an information spreadsheet. Create an outline, add columns for dates, numbers, formulas, pictures, text. See a time chart with a single click** . \$315.

real hard to cope,



Paragon Concepts

1612 **Nisus Compact 3.3**—Small is beautiful: use award-winning Nisus word processing power with less than 400K. Designed for PowerBooks but great for any Mac . . . \$93.

9803	Excel 3.0	295.	1420 Companion Book	20.
4902	Word 5.0			295.
2565	Project 1.1			445.
5454	The Microsoft Office 2.0			475.
Niles & Associates ... 30 day MBG				
5048	EndLink 1.1.3.			58.
4602	EndNote 1.4	85.	8010 Plus 1.1	145.
Nolo Press ... 30 day MBG				
4228	For the Record 2.0			30.
2981	WillMaker 4.0 (not valid in LA.)			35.
1204	Living Trust 1.0			45.
Odesta ... 30 day MBG				
5621	Double Helix 3.5			429.
Paragon Concepts				
1612	Nisus Compact 3.3			93.
5683	Nisus 3.06			238.
Pastel Development				
1785	DayMaker 1.01			61.
Portfolio Systems ... 30 day MBG				
3448	SmartScrap & The Clipper 2.1			56.
7992	DynoPage 1.7 or 6916 Dynodex	ea.		72.



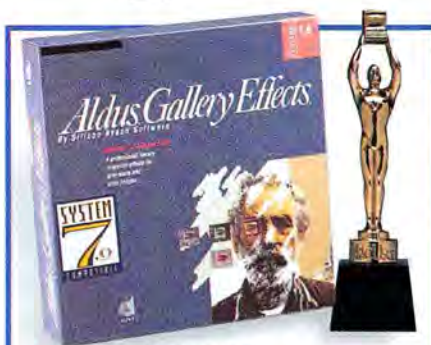
★ Lotus Development ... 60 day MBG

3606 **1-2-3 for the Mac**—Takes full advantage of the Mac. Directly manipulate & format all data, text, & graphics. Offers true 3D worksheets & Excel & 1-2-3 file compatibility \$329.
3604 **1-2-3 Competitive Upgrade** . . . 89.

★ PowerUp ... 30 day MBG				
7696	🕒 Calendar Creator 1.01		\$44.	
7694	📄 Address Book Plus 2.0		63.	
7698	📄 Fast Forms 2.0		112.	
★ Provue ... 60 day MBG				
4582	🖼️ Panorama II 2.0.3		239.	
★ Que Corp. ... 30 day MBG				
7482	🖋️ RightWriter for the Mac 3.1		54.	
★ Reality Technologies ... 30 day MBG				
6929	💰 WealthBuilder 1.02		95.	
★ Reference Software ... 30 day MBG				
6268	📖 Grammatik Mac 2.0		58	
Round Lake Publishing				
9946	📖 LetterWorks, 9945 🖋️ LetterWorks Sales 1.0, or 9947 🖋️ LetterWorks Legal 1.0	ea.	45.	
5473	Professional LetterWorks		51.	
★ Shana ... 30 day MBG				
8810	🖋️ Informed Manager 1.2		99.	
7692	🖋️ Informed Designer 1.2		159.	
★ Softsync, Inc. ... 30 day MBG				
7129	👤 Accountant, Inc. 335. 3828 MultiUser	569.		
Software Toolworks				
8366	📊 Dollars & Sense 5.0		59.	
★ Spyglass ... 60 day MBG				
2033	📄 Format 1.01		159.	
2027	📄 Transform 2.1 (Feb. '92)		399.	
2028	📄 Dicer 1.1		399.	
★ Survivor Software ... 30 day MBG				
3289	📄 MacMoney 3.52		58.	
★ Symantec ... 30 day MBG				
2237	🖋️ GreatWorks	199.	2278 Upgrade	99.
3422	📄 More 3.1		265.	
★ Symmetry ... 30 day MBG				
3131	📄 Acta 7 1.0		75.	
★ Synergy ... 30 day MBG				
6617	📊 KaleidaGraph 2.1.3		150.	
★ Teleware ... 30 day MBG				
7616	📄 M.Y.O.B. 2.1		138.	
★ TIMESLIPS ... 30 day MBG				
2986	📄 Timeslips III 2.1		194.	
★ T/Maker ... 30 day MBG				
3639	📄 WriteNow 3.0 (Mar. '92)		155.	
3508	📦 The PowerBundle (with carry case)		159.	
★ Williams & Macias ... 30 day MBG				
4976	📄 StickyBusiness 1.5		51.	
6926	📄 myDiskLabeler III 3.1		42.	
★ WordPerfect ... 60 day MBG				
3800	📄 WordPerfect Mac 2.0.3		295.	
3090	📄 WordPerfect Office 3.0 (single)		89.	
3092	📄 WP Office (5 pack) 295. 3088 (20 pack)		895.	
★ Wordstar ... 30 day MBG				
3554	📖 American Heritage Dictionary		55.	
6984	🖋️ Correct Grammar 3.0		55.	
★ Wyoming Software ... 30 day MBG				
3555	📖 Business Sense 1.5		124.	

GRAPHICS & DESIGN PUBLISHING, PRESENTATIONS

★ Abracadata, Ltd. ... 30 day MBG			
9995	Instant Decorator 1.1		29.
9990	Design Your Home—Architecture, 9992 Interiors, or 9994 Landscape	ea.	63.
Adobe Systems			
8794	Adobe Type Library (Vol. 1-250)		call
6957	Adobe Type On Call		47.
5750	Adobe Type Reunion 1.0.2		41.
6053	Adobe Type Manager 2.0		59.
6156	Adobe Plus Pack 2.0		118.
6098	Adobe Plus Pack/ATM		174.
	TypeAlign for ATM 1.0.4		62.



★ Aldus ... 30 day MBG

2461 **Aldus Gallery Effects 1.0**—1991 MacUser Editors' Choice Award for Best Visual Resource. Transforms images into works of art. Whether scanned or original art, you can apply professional-looking effects easily & in minutes \$128.

5001	Streamline 2.0		122.
4145	Adobe Premiere 1.0		305.
8171	Adobe Illustrator 3.2 (with ATM)		368.
6644	Adobe Photoshop 2.0		548.
6671	Adobe Type Set 1 or 6677 Type Set 2		62.
7587	Adobe Type Set 3		125.
Adobe Type Sets for Business:			
2221	Letters, Memos & Faxes		95.
2223	Invitations & Awards		95.
2219	Spreadsheets & Graphs		95.
2222	Overheads & Slides		95.
★ Aldus ... 30 day MBG			
6674	Aldus Personal Press 1.01		109.
2461	Aldus Gallery Effects 1.0		128.
3506	Aldus SuperPaint 3.0		132.
3980	Aldus Digital Darkroom 2.0		259.
3507	Aldus Super 3D 2.5		325.
7467	Aldus PrePrint 1.51		325.
4751	Aldus Persuasion 2.1		325.
1330	Aldus FreeHand 3.1		394.
7088	Aldus PageMaker 4.2		494.



★ Abracadata, Ltd. ... 30 day MBG

9990 **Design Your Own Home—Architecture**—Modify or design the home of your dreams! Includes a library of architectural objects and sample floor plans. Everything you need to create professional drawings or a simple sketch . \$63.

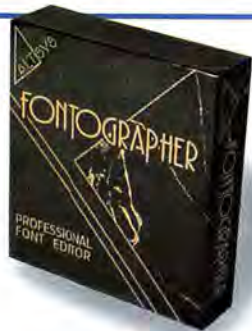
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Altsys

1195 **Fontographer 3.5**—New! Pressure-sensitive pen tool, change weight, & calligraphic features. Create PostScript & TrueType fonts with this easy-to-use industry standard program. Modify existing fonts or design your own! \$262.

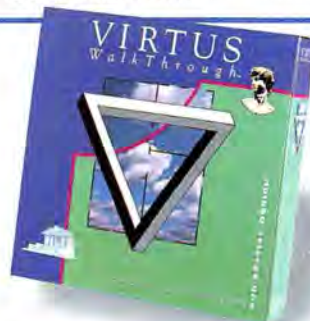
Altsys	
9806	Metamorphosis Pro 2.03 89.
1983	EPS Exchange 2.0 89.
1195	Fontographer 3.5 (Feb. '92) 262.
★ Expert Software ... 30 day MBG	
8878	FontMonger 1.05 62.
★ Baseline Publishing ... 30 day MBG	
8055	Screenshot 1.2 34.
Bitstream	
9428	True Type Fonts 1 or 9429 Fonts 2 . . ea. 59.
1591	True Type Fonts 3 or 1595 Fonts 4 . . ea. 98.
Broderbund Software	
3572	Kid Pix 1.2 34.
1427	The Print Shop 1.3.2 35.
6281	TypeStyler 2.0 (with ATM) 126.
★ Casady & Greene ... 30 day MBG	
8879	Fluent Font Library 4.05 99.
1945	True Type Starter Set 57.
★ Claris ... 30 day MBG	
1123	MacPaint 2.0 86.
2518	MacDraw Pro 1.01 275.
8007	Claris CAD 2.0 625.
Custom Applications	
8037	Freedom of Press Light 3.01 (17 fonts) . 55.
★ DeltaPoint ... 60 day MBG	
3558	DeltaGraph Pro 205.
★ Deneba Software ... 30 day MBG	
3227	Canvas 3.0 248.



★ Alysis Software ... 30 day MBG

1608 **More Disk Space**—Invisibly double the capacity of your hard drive with a single click of the mouse \$55.
2687 **SuperDisk!**—Selectively compress individual files, folders, & volumes on-the-fly. . 49.

★ Expert Software ... 30 day MBG	
4870	Expert Color Paint 1.0 \$29.
★ Foundation Publishing ... 60 day MBG	
6728	Comic Strip Factory 1.6 36.
IDD/Innovative Data Design	
2417	MacDraft 2.1 279.
4707	Dreams 1.10 special 349.
★ Letraset ... 30 day MBG	
2619	ImageStudio 1.5 139.
4709	LetraStudio 2.0 (Mar. '92) 139.
6300	FontStudio 2.0 359.
6301	ColorStudio 1.5 599.
FONTEK Typeface Collection ea. 30.	
★ Linguist's Software ... 60 day MBG	
Over 100 language fonts call	
2638	LaserCyrillic 1.0 99.
★ MacroMind•Paracomp ... 30 day MBG	
3440	QuickPICS 1.0 103.
3148	Magic 1.0 275.
5028	ModelShop II 2.0 619.
7441	SwivelArt (Map & Viewpoint art) . . ea. 175.
3450	Swivel 3D Professional 2.0 479.
3450	SwivelMan 1.0 619.
★ Mainstay ... 30 day MBG	
9798	Capture 4.0 82.
★ MicroFrontier ... 30 day MBG	
3013	Color It! 1.0 73.



★ Virtus Corporation ... 30 day MBG

4488 **WalkThrough 1.03**—Award-winning 3D drawing program with real-time 3D presentations, QuickTime and PICS animation movies, and perspective pictures as well as data exchange capabilities \$249.

★ MicroMaps ... 30 day MBG	
7556	MapArt (PICT) or 7555 (EPS) ea. 89.
★ Microsoft ... 30 day MBG	
2878	PowerPoint 2.01E 245.
★ Monotype Typography ... 30 day MBG	
Monotype Imprints-TrueType ea. 22.	
Classic Fonts (full line available) call	
Postcraft International	
2210	Effects Specialist 1.04 89.
Layouts for PageMaker, ReadySetGo, & QuarkXPress ea. 69.	
Quark	
7612	QuarkXPress 3.1 569.
★ Specular International ... 30 day MBG	
4962	Infini-D 1.1 647.
★ Spinnaker ... 30 day MBG	
3530	Certificate Maker 2.02 22.
Strata	
7773	Stratavision 3D 2.0 629.
★ SuperMac Technology ... 60 day MBG	
3380	PixelPaint 2.1 149. 5625 Pro . . 459.
★ Symmetry ... 30 day MBG	
8172	Mariah 1.0 93.
3G Graphics	
3942	Images with Impact: Graphics 1 49.
6379	Accents & Borders 1 63.
4583	Business 1 63. 2003 People 1 . . 94.



★ Timeworks ... 30 day MBG

7115 **Publish It! Easy 2.1 with File-It!**—Honorable Mention—1991 MacUser Editors' Choice Award for Best Integrated Application. All-in-one desktop publisher combines ease of use with advanced features that make page layout a breeze . . \$145.

★ Timeworks ... 30 day MBG	
7115	Publish It! Easy 2.1 with File-It! 145.
★ T/Maker ... 30 day MBG	
ClickArt (7 bitmapped) ea. 32.	
ClickArt (5 EPS formats) ea. 82.	
1858	ClickArt for Faxes 45.
1292	Color Graphics Presentation 1.0 109.
★ Virtus Corporation ... 30 day MBG	
4488	WalkThrough 1.03 249.
★ Visual Business Sys. ... 30 day MBG	
9867	GraphMaster 1.3 189.

PROGRAMMING

UTILITIES, HYPERCARD, SECURITY

★ Abbott Systems ... 30 day MBG	
2515	Calc+ 1.0 39.
5236	CanOpener 2.0 62.
★ Advanced Software ... 30 day MBG	
8051	Intouch 1.1 39. 9986 Network (3-Pak) 112.
2808	QuickTools 1.01 45.
After Hours Software	
1352	TouchBASE 2.0 78.
★ Aladdin Systems ... 30 day MBG	
6169	Shortcut 1.5 45.
6740	Stuffit Deluxe 3.0 (Mar. '92) 59.
★ Aldus ... 30 day MBG	
5100	Aldus SuperCard 1.6 195.
★ ALSoft ... 30 day MBG	
9808	MasterJuggler 1.57 25.
9807	DiskExpress II 2.10 49.
5204	ALSoft Power Utilities 1.0 69.
★ Alysis Software ... 30 day MBG	
2687	SuperDisk! 49.
1608	More Disk Space 55.
Apple Computer	
1074	System 7 (with free PCTV video) 99.
★ ASD Software ... 30 day MBG	
7085	FileGuard 2.7 (1 user) 138.
7422	(5 user) 479. 7423 (10 user) . . 799.
5313	Active Memory 2.0 (1 user) (Feb. '92) . 125.
5314	(5 user) 315. 5315 (10 user) . . 625.
★ Baseline Publishing ... 30 day MBG	
7783	INIT Manager 1.1 33.
3114	INIT Info Pro 39.
★ Berkeley Systems ... 30 day MBG	
5737	After Dark 2.0V 28.
2198	More After Dark (M.A.D.) 23.
2196	After Dark & M.A.D. Bundle 40.
1541	Stepping Out II 2.02 49.
Bright Star Technology	
2614	At Your Service 1.0 29.
3994	Catalog of Actors (six) 55.

abandon all hope.



★ Casa Blanca Works ... 30 day MBG
1593 ⑦ Drive 7 2.0—The most versatile & affordable formatter available. Incls. Drive7Rem for Syquest, Bernoulli, Optical, & CD-ROMs! \$51.
1573 ⑦ DriveShare—Share removable drives under 6.0x or 7.0x! Max your hardware investment. 89.

★ Casa Blanca Works ... 30 day MBG
1593 ⑦ Drive 7 2.0 ... 51.
1573 ⑦ DriveShare ... 89.
★ Casady & Greene ... 30 day MBG
2269 ⑦ QuickDEX 2.3 ... 22. 2528 (5 Pak) ... 99.
4485 ⑦ Crash Barrier 1.0 ... 45.
★ CE Software ... 60 day MBG
1727 ⑦ CalendarMaker 3.0.1 ... 31.
6278 ⑦ DiskTop 4.01 or 3376 ⑦ Tiles 1.0 ... ea. 63.
7518 ⑦ Alarming Events 1.03 ... 84.
8024 ⑦ QuickKeys² 2.1 ... 93.
1565 ⑦ QuickKeys² (10 user) 749. 1561 (50) 2799.
★ Central Point ... 30 day MBG
5041 ⑦ Mac Tools Deluxe 1.2 ... 79.
★ Claris ... 30 day MBG
8734 ⑦ HyperCard Development Kit 2.1 ... 139.
★ Connectix ... 30 day MBG
7830 ⑦ Maxima 2.0.1 ... 45.
6647 ⑦ HandOff II 2.2.1 ... 55.
★ Cyan ... 30 day MBG
2715 ⑦ Peacock 2.0 (for HyperCard) ... 43.
★ Dantz Development ... 30 day MBG
3393 ⑦ DiskFit Pro 1.0 ... 74.
5255 ⑦ Retrospect 1.3A ... 147.
7945 ⑦ Retrospect Remote 1.3 ... 264.
7946 ⑦ Remote (10 Pak) 147. 3112 (50 Pak) 649.
Dubl-Click Software
6653 ⑦ MenuFonts 4.0 ... 44.
7974 ⑦ ClickChange 1.05.2 ... 56.
1824 ⑦ Calculator Construction Kit 2.09.6 ... 62.
★ ElseWare Corp. ... 30 day MBG
4871 ⑦ Checklist 2.0 ... 89.
1507 ⑦ Bar Code Kit or 1506 ⑦ DataShaper ea. 135.
★ Fifth Generation ... 30 day MBG
4287 ⑦ PYRO! 4.01 ... 27.
3955 ⑦ Suitcase II 2.0 ... 53.
8286 ⑦ SuperLaserSpool 2.02 ... 99.
5178 ⑦ FastBack Plus or 5725 ⑦ DiskLock ea. 127.
★ FWB, Inc. ... 30 day MBG
2999 ⑦ Hard Disk Toolkit 1.0 ... 125.
★ HandOff Corporation ... 30 day MBG
1340 ⑦ TrashMaster 1.0 ... 39.
★ ICOM Simulations ... 30 day MBG
3731 ⑦ OnCue II 2.0 ... 56.
★ Insight Development ... 30 day MBG
6171 ⑦ MacPrint 1.3 ... 92.

★ JAM Software USA ... 30 day MBG
6089 ⑦ Smart Alarms with Appt. Diary 3.0.7 ... \$63.
★ Kensington ... 30 day MBG
9301 ⑦ PassProof (right) or 9300 (left) ... ea. 65.
2011 ⑦ PassProof Classic or 1632 IIsi ... ea. 65.
★ Kent Marsh Ltd. ... 30 day MBG
9513 ⑦ FolderBolt 1.02 ... 73.
1839 ⑦ The NightWatch II (Feb. '92) ... 89.
★ Kiwi Software ... 60 day MBG
6267 ⑦ Kiwi ENVELOPES! 3.1.5 ... 32.
3518 ⑦ Kiwi POWER WINDOWS ... 50.
★ Magic Software ... 30 day MBG
7267 ⑦ AutoSave II or 7268 ⑦ POWERIcons ea. 26.
7270 ⑦ Backmatic 2.01 ... 50.
★ Microcom ... 30 day MBG
8562 ⑦ Complete Undelete 1.1 ... 48.
4803 ⑦ Virex 3.5 ... 57.
8561 ⑦ 911 Utilities or 2462 ⑦ Citadel w/Shredder 89.
MicroMat Computer Systems
2810 ⑦ MacEKG 1.0.9 ... 63.
★ Microseeds Pub. ... 60 day MBG
7068 ⑦ INITPicker 2.02 ... 34.
2913 ⑦ Redux 1.63 or 7116 ⑦ Rival 1.1.8 ... ea. 49.
2936 ⑦ HAM (removes fat from Apple menu) ... 49.
★ Microsoft ... 30 day MBG
4471 QuickBasic 1.0 ... 64.



★ ElseWare Corp. ... 30 day MBG
4871 ⑦ Checklist 2.0—1991 MacUser Editors' Choice Award for Best Prepress Product ... \$89.
1506 ⑦ DataShaper 1.2 ... 135.
1507 Bar Code Kit 1.0d ... 135.

★ Nine to Five Software ... 30 day MBG
9767 ⑦ Reports 2.1 ... 94.
★ Now Software ... 30 day MBG
1793 ⑦ Now Up-To-Date 1.0 ... 65.
6925 ⑦ Now Utilities 3.1 ... 83.
★ ON Technology ... 1 year MBG
6385 ⑦ On Location 2.0 ... 75.
9801 ⑦ Meeting Maker (5) ... 309. 9800 (10) ... 549.
2570 ⑦ Instant Update (2) ... 309. 2571 (5) ... 619.
1566 ⑦ STATUS•Mac 2.0.2 (unlimited) ... 749.
★ Palomar Software ... 30 day MBG
8210 ⑦ PLOTTERgeist 2.0 ... 249.
★ Salient Software ... 30 day MBG
7404 ⑦ DiskDoubler 3.7 ... 45.
4838 ⑦ AutoDoubler 1.0 ... 45.
★ Symantec ... 30 day MBG
5176 ⑦ Symantec AntiVirus for Mac (SAM) ... 64.
5724 ⑦ Symantec Utilities for Mac (SUM II) ... 96.
6748 ⑦ Norton Utilities for the Mac 1.1 ... 79.
3598 ⑦ Norton Utilities & SAM Bundle ... 118.



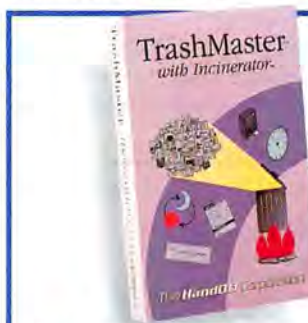
MicroMat Computer Systems
2810 ⑦ MacEKG 1.0.9—Detect software & hardware problems BEFORE they occur. This new diagnostic measures every performance indicator giving you a virtual "dashboard" for your Mac. Digital voice announces test results ... \$63.

3421 ⑦ THINK Pascal 165. 2688 ⑦ THINK C 199.
9957 ⑦ THINK Reference 1.0 ... 64.
Teknosys
5203 ⑦ HELPI! 1.0.1 ... 89.
★ TGS Systems ... 60 day MBG
6667 ⑦ Prograph 2.5 ... 309.
★ Thought I Could ... 30 day MBG
4843 ⑦ Wallpaper 1.0.1 ... 37.
★ Visionary Software ... 30 day MBG
3888 ⑦ Synchronicity 3.0 ... 35.
3887 ⑦ First Things First 2.0 ... 41.
★ Wolfram Research ... 30 day MBG
8273 ⑦ Mathematica Enhanced 2.0 ... 789.

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Accolade
1423 Hard Ball II or 8217 Ishido ... ea. 31.
8220 ⑦ Jack Nicklaus Golf ... 34.



★ HandOff Corporation ... 30 day MBG
1340 ⑦ TrashMaster 1.0—Keep precious disk space free & precious data from falling into the wrong hands. Automated trash emptying & file erasing per US DOD spec. Selective emptying via menu. Completely user-configurable ... \$39.

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- ★ **Aldus ... 30 day MBG**
 3503 7 Dark Castle 1.1 \$34.
 3502 7 Beyond Dark Castle 1.0 34.
 ★ **Baseline Publishing ... 30 day MBG**
 7785 7 Talking Moose 4.0.2 22.
 ★ **Beacon Technology ... 30 day MBG**
 4967 7 HyperBible (KJV) or 4968 (NIV) .. ea. 125.
Broderbund Software
 4314 7 Type! 1.0 18.
 6516 7 The Playroom 2.0 (CP) (color) 29.
 7785 7 Carmen Sandiego Series (CP) ea. 29.
 6384 7 PlayMaker Football (color) (Feb. '92) 29.
 5317 7 Spelunx and the Caves of Mr. Suedo 29.
 9804 7 RoboSport or 8195 7 BannerMania 35.
 3559 7 SimAnt or 5318 7 Nigel's World 35.
 3562 7 Patton Strikes Back 35.
 8266 7 SimEarth 1.1 40.
 4966 7 SimCity (CP) 29. 5871 7 Supreme 47.
 ★ **Carina Software ... 30 day MBG**
 5726 7 Voyager 1.2 87.
 ★ **Casady & Greene ... 30 day MBG**
 4119 7 Crystal Quest with Critter Editor 2.2x 29.
 7495 7 Mission Starlight or 7498 7 Sky Shadow 29.
 3343 7 Aqua Blooper Piper or 3342 7 Glider 29.
 4960 7 Fun Bundle (includes Crystal Quest w/CE, Sky Shadow & Mission Starlight) 59.
 ★ **Centron Software ... 30 day MBG**
 2707 7 Puzzle Master 26.
 8525 7 Casino Master (B&W) 41. 8524 (Color) 45.



★ **Expert Software ... 30 day MBG**
 4870 7 Expert Color Paint 1.0—New! The latest in painting tools at an incredible price. You get hot 32-bit color, image editing, and tools that may be customized, anti-aliasing, virtual memory and System 7 support \$29.

- ★ **Davidson & Associates ... 30 day MBG**
 3922 7 Talking Spell It Plus 29.
 6128 7 MathBlaster Mystery 28.
 2574 7 MathBlaster Plus 34.
 8278 7 Alge-Blaster Plus 34.
 3923 7 Personal Trainer SAT 34.
 ★ **Deadly Games ... 30 day MBG**
 2811 7 Bomber or 3460 7 Battle of Britain II ea. 31.
EARTHQUEST
 3118 7 EARTHQUEST Ecology 1.0 34.
 8050 7 EARTHQUEST 2.0 34.
Electronic Arts
 6716 7 Pipe Dream 1.2 17.
 1303 7 Loom 1.0 29.
 8194 7 Armor Alley 1.1 32.
 1907 7 PGA Golf or 2963 7 Starflight II 1.0 ea. 39.
 3385 7 Secret of the Silver Blades 39.
 8643 7 Harpoon 39.
 2962 7 Harpoon Challenger Pak 59.
FTL/Software Heaven
 1555 7 OIDS 1.2 24.
 ★ **Great Wave ... 30 day MBG**
 2276 7 Kid's Time 1.3 or 5642 7 Kid's Math 1.1 25.
 2270 7 American Discovery 3.0 25.
 1517 7 ReadingMaze 25. 1513 7 (Color) 35.



★ **Baseline Publishing ... 30 day MBG**
 7785 7 Talking Moose—1991 MacUser Editors' Choice Award for Best Desktop Diversion \$23.
 7783 7 INIT Manager 1.1—Locate, manage and analyze all your startup documents 34.
 3114 7 INIT Info Pro—Guide to INIT and system incompatibilities 39.

- 4334 7 NumberMaze 25. 8527 7 (Color) 35.
 8044 7 NM Decimals & Fractions (Color) 35.
 ★ **HyperGlut Software ... 30 day MBG**
 7785 7 Word Torture 4.0—Beginner to Advanced (Span., Fren., Germ., Ital. & Rus.) ea. 34.
 7786 7 Pronunciation Tutor - Beginner (Span., Fren.) ea. 35. (Germ., Chin.) 38.
 7787 7 Verb Tutor - Intermediate (Spanish, French, German) ea. 38.
 7788 7 Tense Tutor 2.0 (Spanish, French, German, Italian) ea. 38.
 7789 7 Survival Manual (Span., Fren., Germ., Ital., Chin. & Rus.) ea. 38.
 ★ **Inline Design ... 30 day MBG**
 1562 7 3 in Three 31.
 1944 7 Swamp Gas 31.
 8809 7 Tesseract (addictive puzzle) 31.
 7622 7 Darwin's Dilemma 2.0 (Feb. '92) 31.
 3414 7 Mutant Beach 43.
Interplay Productions
 1894 7 BattleChess (3D animation) 29.
 3520 7 Dvorak on Typing 29.
 1893 7 CheckMate (infinite play levels) 31.
 3534 7 Castles 1.0 (Feb. '92) 34.
 ★ **Learning Company ... 30 day MBG**
 2670 7 Reader Rabbit 3.0 (CP) (ages 4-7) 34.
 3272 7 Outnumbered 1.0 34.
 3281 7 The Writing Center 1.0 51.



★ **ON Technology ... 1 year MBG**
 1566 7 STATUS*Mac 2.0.2 (unlimited)—Network configuration mgmt. software which remotely gathers accurate hardware & software info 749.
 9801 7 Meeting Maker (5 user) 309.
 2570 7 Instant Update (2 user) 309.

- ★ **Leister Productions ... 30 day MBG**
 7126 7 Reunion 3.0 \$115.
Mallard Software
 7785 7 Scenery Disks 1-4 Flight Simulator ea. 30.
 ★ **MECC ... 30 day MBG**
 3963 7 Oregon Trail 1.0 28.
 3960 7 Number Munchers 1.2 28.
 3959 7 Word Munchers 1.2 28.
 4095 7 Super Munchers 1.0 28.
 ★ **Microsoft ... 30 day MBG**
 2868 7 Flight Simulator 4.0 (CP) 42.
 ★ **Mysterium Tremendum ... 30 day MBG**
 5841 7 Moriarty's Revenge 1.03 32.
 ★ **Nordic Software ... 30 day MBG**
 8258 7 Turbo Math Facts 1.1 24.
 8260 7 Word Quest 1.0 30.
 8257 7 PreSchool Pack - Color 1.0 34.
 2716 7 Word Search Deluxe 1.0 34.
 ★ **Penton Overseas ... 30 day MBG**
 7785 7 VocabuLearn/ce Levels I & II (Span., Fren., Germ., Ital., Rus., Japan., & Heb.) ea. 35.
 7786 7 VocabuLearn/ce Level III (Span., Fren., Germ., Ital., Rus., & Japan.) ea. 35.
 7787 7 PICTURE-ITI! (Spanish, French, German, & Italian) ea. 40.



★ **Inline Design ... 30 day MBG**
 1562 7 3 in Three—1991 MacUser Editors' Choice Award for Best Game \$31.
 1944 7 Swamp Gas—Honorable Mention—1991 MacUser Editors' Choice Award for Best Children's Program 31.

- ★ **Personal Training Sys. ... 60 day MBG**
 7785 7 Basic Macintosh (modules 1-4) ea. 59.
 7786 7 Converting 6.0 to 7.0 (modules 1-2) ea. 59.
 7787 7 Excel 2.2, 3.0 (modules 1-9) ea. 59.
 7788 7 FileMaker Pro (modules 1-5) ea. 59.
 7789 7 FreeHand 3.0 (modules 1-5) ea. 59.
 7790 7 HyperCard 1.0, 2.0 (modules 1-4) ea. 59.
 7791 7 PageMaker 4.0 (modules 1-6) ea. 59.
 7792 7 Persuasion 2.0 (modules 1-4) ea. 59.
 7793 7 QuarkXPress 3.0 (modules 1-4) ea. 59.
 7794 7 System 7 (new users) (modules 1-3) ea. 59.
 7795 7 Word 4.0 (modules 1-4) ea. 59.
 7796 7 Works 2.0 (modules 1-4) ea. 59.
Postcraft International
 6466 7 Citadel 1.21 26.
Sierra On-Line
 9733 7 Hoyle's Book of Games II 20.
 7367 7 Space Quest III 34.
 2522 7 Space Quest IV or 2523 7 King's Quest V ea. 39.
Sir-Tech Software
 8228 7 Wizardry II: Knight of Diamonds 28.
 8229 7 Bane of Cosmic Forge 35.
 ★ **SoftStream ... 30 day MBG**
 4073 7 Colour Billiards 38.
 3501 7 Classic Trilogy (Cribbage, Whist, Hearts) 50.
 3472 7 Family Cards (Solitaire, Rummy, War) 50.
Software Toolworks
 4619 7 Mavis Beacon Typing 1.3 (CP) 32.
 1908 7 World Atlas 1.0 52.

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★ **SuperMac Technology ... 30 day MBG**
VideoSpigot—Digital-video frame grabber for making QuickTime movies. Includes VHS Video Input via RCA jack.
 4122 *VideoSpigot LC or 4114 VS IIsi*... ea. \$447.
 4164 *VideoSpigot (for NuBus)*... 536.

★ **Spectrum Holobyte ... 30 day MBG**
 8180 ⑦ Faces 1.0... 14.
 3464 ⑦ Tetris 1.3 or 6112 ⑦ Welltris 1.1... ea. 22.
 3017 ⑦ Wordtris 1.0... 27.
 3459 ⑦ Falcon 2.2.1 or 8181 ⑦ Vette 1.0... ea. 33.
 ★ **Spinnaker ... 30 day MBG**
 2328 Sargon IV 1.03 (CP) (chess)... 28.
 ★ **Strategic Studies ... 30 day MBG**
 8085 ⑦ Panzer Battles 1.3.2... 26.
 2685 ⑦ American Civil War 1.0... 29.
 3287 ⑦ Warlords (empires at war) (Feb. '92)... 34.
StudyWare
 ⑦ ACT, GMAT, GRE, or SAT Prep... ea. 29.
 8098 ⑦ LSAT Prep for the Mac 3.7... 35.
Terrace Software
 9970 ⑦ Mum's The Word Plus 1.01 (color)... 107.
 ★ **Toyogo ... 30 day MBG**
 7836 ⑦ NEMESIS Go Junior 5.0... 19.
 1993 ⑦ NEMESIS Scribbler 5.0... 29.
 7624 ⑦ NEMESIS Go Master 5.0... 39.
 7623 ⑦ NEMESIS Go Master Deluxe 5.0... 99.



★ **Sound Source ... 30 day MBG**
 3547 ⑦ *Star Trek: The Logical Collection*—Exciting new Star Trek sounds. Incl. everyone's favorite dialog, sound effects and music cues... \$29.
 3607 ⑦ *Star Trek: The Final Frontier*—Features sounds for the hard-core Trekkie... 29.
 4920 ⑦ *Star Trek: The Bundle*... 49.

★ **XOR ... 30 day MBG**
 6040 MacGolf Classic... \$52.

VIDEO & SOUND MONITORS, MUSIC, ANIMATION

★ **Ars Nova ... 30 day MBG**
 1215 ⑦ Practica Musica 2.2... 66.
 ★ **Bogas Productions ... 60 day MBG**
 6135 Super Studio Session with Music Library... 99.
Coda Music Systems
 8188 ⑦ MusicProse 2.1... 189.
 5604 ⑦ Finale 2.6.1... 549.
Full Logic Studios
 1163 ⑦ Mac-Sound (241 great sound effects)... 75.
 ★ **MacroMind•Paracomp ... 30 day MBG**
 2199 MacRecorder Sound System... 174.
 6159 ⑦ MacroMind Accelerator 3.0... 135.
 9353 ⑦ MacroMind MediaMaker 1.2... 479.
 5087 ⑦ MacroMind Director 3.0... 689.
 2246 ⑦ MacroMind Three-D 1.0... 1025.
Mass Microsystems
 2592 QuickImage 24... 289.
 Rival Monochrome Systems... ea. 1199.

★ **Nutmeg Systems ... 30 day MBG**
 ⑦ 19" for SE, SE/30, II, IIsi... ea. 995.
 ⑦ 19" for GrayScale SE/30, II, IIsi... ea. 1295.
 ⑦ 20" Color System: SE/30, II, IIsi... ea. 2595.
Passport Designs
 8253 ⑦ TRAX 2.2... 68.
 3115 ⑦ MIDI Interface... 79.
 3117 ⑦ Master Tracks PRO 4 4.5.3... 315.
 8250 ⑦ Encore 2.51... 379.
PCTV
 2244 System 7 Video... 9, 2245 w/Lon's Book... 25.
Pixar
 1596 ⑦ ShowPlace & MacRenderMan Bundle... 645.
RasterOps
 8526 Video Expander... 499.
 3224 Espresso Slide Scanner... 699.
 9784 RasterOps 24SX... 8944 24STV... 1249.
Software Toolworks
 5201 The Miracle (piano teacher)... 349.
 ★ **Sound Source ... 30 day MBG**
 ⑦ Star Trek: The Logical Collection... 29.
 ⑦ Star Trek: The Final Frontier... 29.
 ⑦ Star Trek: The Bundle (I gotta have both!)... 49.
 ★ **SuperMac Technology ... 30 day MBG**
 4139 Monochrome Card (NuBus only)... 357.
 4134 19" Gray-Scale/Mono Display... 999.
 1805 19" SuperMatch Color Display... 1799.
 1813 Color Calibrator... 549.
 1877 Spectrum/8LC or 2026 S/8si... ea. 536.
 1844 Spectrum/8 Series III... 536.
 1851 Spectrum/24 Series III... 1525.
 2330 Spectrum/8-24 PDQ or 2231 PDQsi... ea. 899.
 4122 VideoSpigot LC or 4114 IIsi... ea. 447.
 4164 VideoSpigot (for NuBus)... 536.
 ★ **Voyager ... 30 day MBG**
 9322 ⑦ Voyager Videostack CD 2.2... 65.
 9328 ⑦ Voyager CD Audiostack... 65.
 9326 ⑦ Beethoven: Symphony No. 9 CD 2.0... 65.

CD-ROM

Adobe Systems
 8794 ⑦ Adobe Type On Call CD/ATM... 47.
CD Technology
 2321 CD-ROM Caddy... 11, 2533 (5)... 49.
 8057 Porta Drive CD-ROM... 599.
 4140 ⑦ Multimedia HANDisc... 75.



★ **Deneba Software ... 30 day MBG**
 3227 ⑦ *Canvas 3.0*—1991 MacUser Editors' Choice Award for Best Drawing Program. Features Bezier font outlines, professional word-processor-like text capabilities, object blending, a freehand Bezier curve tool, and more... \$248.

★ **Cyan ... 30 day MBG**
 2717 ⑦ Cosmic Osmo 1.1 (CD-ROM)... 37.
 ★ **Discovery Systems ... 60 day MBG**
 9967 ⑦ Nautilus (subscription, CD-ROM)... 20.
 9965 ⑦ Sherlock Holmes (CD-ROM)... 26.
 9966 ⑦ Shakespeare on Disc (CD-ROM)... 26.
 9968 ⑦ Birds of North America (CD-ROM)... 50.
 1874 ⑦ Mammals of No. America (CD-ROM)... 50.
 2484 ⑦ The Family Doctor (CD-ROM)... 115.
 ★ **Everex ... 30 day MBG**
 1875 Metro CD-ROM Drive 1.3... 469.
 ★ **Highlighted Data ... 30 day MBG**
 7771 ⑦ Webster's Dictionary (CD-ROM)... 159.
 ★ **HyperGlott ... 30 day MBG**
 7473 ⑦ Learn To Speak French (CD-ROM)... 62.
 7829 ⑦ Learn To Speak Spanish (CD-ROM)... 62.
 2615 ⑦ Lingua ROM II (3-CD Set)... 599.
 ★ **ICOM Simulations ... 30 day MBG**
 3717 ⑦ Sherlock Holmes Consulting Detective... 39.
 ★ **Microsoft ... 30 day MBG**
 6382 ⑦ The Microsoft Office (CD-ROM)... 479.



★ **Prometheus ... 30 day MBG**
 8990 ⑦ *ProModem Ultima Home Office*—V.32bis Ultima with voice feature added at an even lower price, turns your Mac into an answering machine. 14,400 bps data modem with V.42bis/MNP 5 & 9600 bps S/R fax & full voice capability!... \$489.

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When you're at the



★ **T/Maker ... 30 day MBG**
3639 **WriteNow 3.0**—The fastest Mac word processor. A 2x winner of *MacUser's Best Word Processor Award*. Incl. a lightning-fast 135,000-word spell checker, a thesaurus DA, powerful style sheets, MS Word compatibility \$155.

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6625	Clip-Art 3D (2500 full-color images) 246.
6636	Image Gallery (2800 line art) 246.
9441	CDR36 CD-ROM Portable Drive 399.
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5161	CDR73 CD-ROM Drive 599.
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2611	Vocabulearn/ce 2.0 Spanish 1 CD 69.
2610	Vocabulearn/ce 2.0 French 1 CD 69.
Pixar	
3566	Showplace & RenderMan CD-ROM 448.
Software Toolworks	
3915	Grolier Encyclopedia (CD-ROM) 249.
4397	Time Table History (CD-ROM) 57.
★ Voyager ... 30 day MBG	
3918	Baseball's Greatest Hits (Feb. '92) 39.
3921	Mozart Dissonant Quartet CD 39.
3917	A Silly, Noisy House CD 39.
3919	Armando Stories CD 39.
3316	Exotic Japan CD 1.0 65.

COMMUNICATIONS MODEMS, MAIL, NETWORKS

★ Abaton ... 30 day MBG	
6266	InterFax 24/96 Modem 289.
2724	InterFax 24/96 with InterShare 339.
★ Applied Engineering ... 30 day MBG	
8362	QuadraLink (with AE Shadow) 205.
★ Argosy Software ... 30 day MBG	
7872	Software Bridge/Mac 2.0.1 99.
2447	RunPC/Remote 139.
2448	RunPC/Network 279.
★ CE Software ... 60 day MBG	
8066	QuickMail (5 user) 249. 8067 (10 user) 375.
1589	QuickMail (50) 1549. 3489 (100) 2899.
★ CompuServe ... 60 day MBG	
1676	Macintosh Membership Kit 1.5 25.
1673	CompuServe Navigator 3.04 49.
1674	Membership Kit/Navigator Bundle 72.
★ DataViz ... 60 day MBG	
1823	MacLink Plus/PC 6.0 129.
4842	MacLink Plus/Translators 6.0 109.
★ Dayna ... 60 day MBG	
DaynaPORT E: (10BASE-T) ea. 207.	
DaynaPORT E: SE, SE/30, II, IISI, LC 207.	
8719	EtherPrint or 9888 (10BASE-T) ea. 345.
Dove Computer	
6758	DoveFax 2.0 269. 3352 NuBus 329.
9634	DoveFax Plus 395. 4111 NuBus 429.
4110	DoveFax LAN 499. 4109 NuBus 529.

★ **Farallon Computing ... 30 day MBG**

Full line available. Partial listing.

9805	Timbuktu 4.0.2 \$129.
4866	Timbuktu/Remote 3.0 129.
6273	PhoneNET StarConnector 10-Pack 129.
4869	PhoneNET Connector 10-Pk (DIN8) 198.
2206	PhoneNET StarController 307 899.
4802	PhoneNET StarController 357 1025.
4814	PhoneNET StarController 377 1299.
9961	PhoneNET Card PC 209.
PhoneNET Ethernet Card (SE/30, II, si) ea. 173.	
PhoneNET Ethernet Card (10 pack) ea. 1659.	

★ **Freesoft ... 60 day MBG**

6115	White Knight 11 85.
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★ **Global Village ... 30 day MBG**

8946	TelePort A300 1.06 129.
8945	TelePort/FAX 1.06 169.
5327	TelePort/Full FAX 2.0 219.
5321	PowerPort/IV.32 2.0 489.

★ **Hayes**

2300	Smartcom II for the Mac 3.3 84.
8614	Personal Modem 2400 Plus 149.
3522	OPTIMA 96 Modem 389.
7391	ULTRA 96 Modem 669.

★ **IBS ... 30 day MBG**

8581	DataClub Classic (3) 265. 8580 (10) 539.
1495	DataClub Elite 939.



★ **Letraset ... 30 day MBG**

6300 **FontStudio 2.0**—1991 MacUser Editors' Choice Award for *Best Typographic Product* \$359.
FontEK Typeface Collection—100 new innovative typefaces avail. Each package contains TrueType and PostScript Type 1 font formats ea. 30.

Insignia Solutions

7557	Access PC 1.1 60.
9726	Entry Level SoftPC 2.5 125.
4089	Universal SoftPC 2.5 195.
3229	SoftAT 2.5 299.
3441	SoftNode 1.0 105. 3454 (10 Pak) 699.

★ **Microcom ... 30 day MBG**

7459	CarbonCopy Mac 2.0 (single) 59.
1556	CarbonCopy Mac 2.0 (unlimited) 179.

★ **Microsoft ... 30 day MBG**

9444	Microsoft Mail 3.0 (1-5 user) 269.
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★ **Orange Micro ... 30 day MBG**

2392	Orange386 (20 MHz) 1799.
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★ **Practical Peripherals ... 30 day MBG**

2400 V.42 bis Modem 199.	
7934	PM9600SA Modem 1.26 469.
9849	SmartPack 9600 (with Smartcom II) 529.

★ **Prometheus ... 30 day MBG**

2590	ProModem 2400 Mini Plus 129.
3832	ProModem Remote Plus 225.
3232	ProModem 24/96 S/R Minifax Plus 269.
3831	ProModem 9600M-EC 375.
8990	ProModem Ultima Home Office 489.

★ **PSI Integration, Inc.**

3143	COMstation One 249. 3142 Two 299.
5340	COMstation Four 439.



★ **Berkeley Systems ... 30 day MBG**

2198 **More After Dark (M.A.D.)**—Honorable Mention—1991 MacUser Editors' Choice Award for *Best Desktop Diversion*. 25 new displays \$23.
5737 **After Dark 2.0V**—Stops screen burn-in. 28.
2196 **After Dark & M.A.D. Bundle** 40.

5339	TravelCOM (pocket modem) 499.
5320	PowerModem (for PowerBook) 215.

★ **Shiva ... 30 day MBG**

3444	NetSerial 1.35 275.
4347	NetBridge or 4942 TeleBridge 409.
NetModem/E (thick, thin, 10BASE-T) ea. 1679.	

★ **Sitka/TOPS**

4188	Teleconnector (DIN8) 23. 2230 (10) 189.
6264	TOPS Network 3.1 187.

★ **Software Ventures ... 30 day MBG**

3455	MicroPhone II 4.0 215.
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★ **Synergy ... 30 day MBG**

6618	VersaTerm 4.6 90. 6619 PRO 3.6 177.
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★ **TechWorks ... 30 day MBG**

1582	GraceLAN 285. 1584 Corporate 689.
1781	GraceLAN Update Mgr. Single Zone 169.
1782	GraceLAN Update Mgr. Multiple Zone 285.
1767	GraceLAN Asset Manager 499.

★ **White Pine Software ... 30 day MBG**

3535	Mac 240 139. 3541 Mac 241 199.
3544	Exodus 3.0 199.

★ **Zoom Telephonics ... 30 day MBG**

1168	MX2400R Modem (w/QuickLink II) 69.
1176	MX2400S Modem (with SendFax 9600) 79.
2310	FX9624 Send/receive Fax/Modem 119.
3576	FX9624V Send/receive V.42 Fax/Modem 145.
1179	V.42bis Modem (with MacPack) 125.
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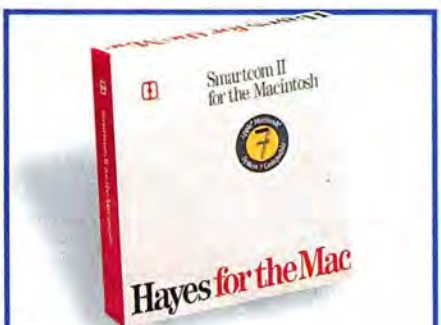


★ **Argosy Software** ... 30 day MBG
 7872 ⑦ *Software Bridge/Mac 2.0.1*—Translate documents between over 30 Mac and PC word processors. Mount DOS disks . . . \$99.
 2448 ⑦ *RunPC/Network*—Connect to a PC and run DOS programs. Incl. Software Bridge . . . 279.

★ **Micron** ... 30 day MBG
 7149 ⑦ Xceed IIci-128K Cache Card . . . 239.
 2262 Xceed Color 30 Card (SE/30) . . . 279.
 2260 Xceed Gray-Scale 30 Adapter Card . . . 75.
Peripheral Land, Inc. (PLI)
 1866 Quick SCSI Card (requires cable) . . . 319.
 8335 PLI TurboFloppy 1.4 . . . 309.
 8327 PLI Infinity 40 Turbo (removable) . . . 699.
 9752 PLI Infinity 88 Turbo . . . 849.
 2325 PLI Infinity Optical Drive . . . 3199.
 2644 Quantum 52 MB External . . . 479.
 8330 PLI 105 MB . . . 619.
 2327 PLI 2GB DAT Drive . . . 1939.
PSI Integration, Inc.
 3135 PSI MultiColor . . . 99.
 3137 Crunch-It! LC . . . 113.
Sigma Designs
 1501 DoubleUp with ⑦ DiskDoubler 3.7 . . . 179.
 ★ **Total Systems** ... 30 day MBG
 7817 16 MHz Mercury 030 (for Mac SE) . . . 359.
 7816 20 MHz Gemini 030 . . . 799.
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 2215 3 1/2" HD Disks (10) . . . 15. 2241 (50) . . . 59.



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4863 3 1/2" HD Disks (20) w/storage case . . . \$26.
 2243 3 1/2" Color (10) DS . . . 10. 2239 HD . . . 18.
 Fuji 1/4" Data Cartridges . . . call
 5345 DG60M . . . 16.
 ★ **Sony** ... 60 day MBG
 3297 3 1/2" DS Disks (10) . . . 9. 6148 (30) . . . 25.
 3298 3 1/2" HD Disks (10) . . . 15. 6375 (30) . . . 42.
 1603 DG60M . . . 16. 2520 DG90M . . . 22.
 Sony 1/4" Data Cartridges . . . call
 ★ **SyQuest** ... 60 day MBG
 6592 44 MB Cartridge . . . 69. 9728 (10) . . . 649.
 3603 88 MB Cartridge . . . 110. 3600 (10) . . . 999.
 ★ **3M** ... 60 day MBG
 3943 DC2000 40 MB Data Cartridge . . . 17.

ACCESSORIES

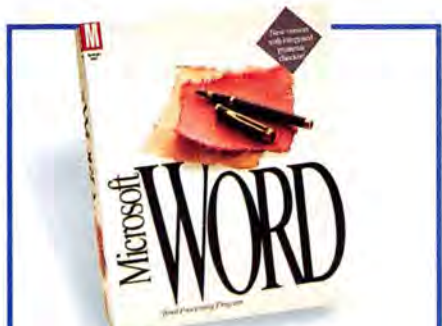
TONERS, CASES, DUST COVERS

Apple Computer
 9773 StyleWriter Ink Cartridge . . . 22.
 7748 Personal LaserWriter Toner Cartridge . . . 87.
 1115 LaserWriter II Toner Cartridge . . . 105.
 ★ **Avery** ... 60 day MBG
 7050 Avery 5660 (1" x 2 5/8" Clear Adrs.-Laser) . . . 32.
 4811 Avery 5182 (8 1/2" x 11" Trans.-Laser) . . . 22.
 5392 Avery 5196 (3 1/2" Disk Labels-Laser) . . . 29.
 4807 Avery 5160 (1" x 2 5/8" Address-Laser) . . . 24.



★ **Softsync, Inc.** ... 30 day MBG
 7129 ⑦ *Accountant, Inc. 3.0*—1991 MacUser Editors' Choice Award for Best Accounting Package. "The most complete integrated accounting and financial mgmt. package," *MacUser* (3/91). \$335.
 3828 ⑦ *Accountant, Inc./MultiUser 1.0* . . . 569.

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 Full line of Dust Covers, etc. . . . call
 ★ **Curtis Manufacturing** ... 30 day MBG
 8973 Apple Security Kit (SL-2) . . . 22.
 ★ **Goldstein & Blair** ... 30 day MBG
 8374 ⑦ *The Macintosh Bible (with disks)* . . . 25.
 ★ **I/O Design** ... 30 day MBG
 Full line of Dust Covers (teal green) . . . call
 8812 Ultimate Classic Carrying Case . . . 64.
 3371 Ultimate PowerBook Carrying Case . . . 75.
 1941 Ultimate LC Carrying Case . . . 95.
 ★ **Kensington** ... 30 day MBG
 Full line available. Partial listing.
 4973 Power Tree 20 . . . 27.
 2559 Apple Security Kit . . . 33.
 9303 Keyboard Shelf . . . 39.
 6763 Mac SE Anti-Glare Filter . . . 52.
 5064 Apple Color Monitor Polarizing Filter . . . 63.
 ★ **MacConnection** ... 60 day MBG
 1505 Oak Disk Case (36) . . . 21. 4623 (90) . . . 32.
 ★ **Moustrak** ... 60 day MBG
 2694 Moustrak Pad (7"x9") . . . 8. 2692 (9"x11") . . . 9.
 2693 Moustrak Pad Low Friction (9"x11") . . . 10.
 MouseGlove (assorted colors) . . . ea. 10.
 ★ **Targus** ... 60 day MBG
 3617 Mac Classic/Plus/SE Case . . . 59.



★ **Microsoft** ... 30 day MBG
 4902 ⑦ *Word 5.0*—New features include an integrated grammar checker, Drag-and-Drop text, and a new Print Merge Helper. Whether you're a beginner or an expert, Word offers all the tools you need to make everyday easier . . . \$295.

1305 Universal Notebook (for PowerBooks) . . . 69.
 4015 Mac SE & Ext. Kybd. Carry Case . . . 75.
 ★ **T/Maker** ... 30 day MBG
 5316 The PowerBundle Carry Case (only) . . . 75.

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KEYBOARDS, MICE, TRACKBALLS, PRINTERS & SCANNERS

★ Abaton ... 30 day MBG

- 7432 ⑦ Scan 300/GS (reqs. Scan Kit) ... \$829.
- 2742 Scan 300/Color (reqs. installation kit) ... 989.
- 1496 Inst. Kit for 300/Color with Photoshop ... 479.
- 1537 LaserScript LX ... 1729.

★ Advanced Gravis ... 30 day MBG

- 9963 ⑦ Gravis Mouse Stick ... 59.
- 9964 ⑦ Gravis Super Mouse ... 79.

American Power

- 5895 UPS 110SE ... 209. 6686 UPS 370ci ... 339.
- 3447 SurgeArrest Plus ... 39.

Caere

- 8124 ⑦ Typist Plus Graphics ... 475.
- 4476 ⑦ OmniPage 3.0 ... 475.
- 4930 ⑦ OmniPage Professional 1.01 ... 669.

CoStar

- 1884 ⑦ LabelWriter II ... 189.
- 1418 AddressWriter ... 498.
- ⑦ Stingray ADB (platinum or black) ... ea. 89.

★ Curtis Manufacturing ... 30 day MBG

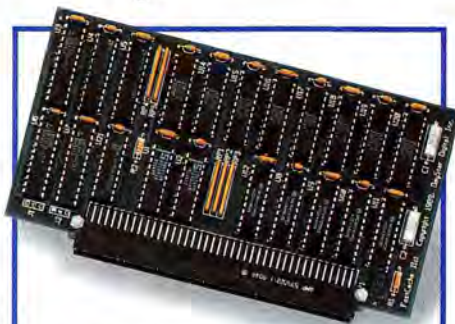
- 8046 MVP Mouse (MVP-1) ... 89.

★ Datedesk ... 30 day MBG

- 9830 ⑦ MAC101E. 129. 2384 with QuicKeys. 149.
- 6901 Switchboard (modular keyboard) ... 159.

★ Everex ... 30 day MBG

- 1144 ⑦ Silhouette Trackball 1.0 (ADB Macs) ... 78.



★ DayStar Digital ... 30 day MBG

FastCache—Highly-rated *FastCache* is now available for the Mac IIci, IIsi & the Quadra 700 or 900. Mac IIsi version includes adapter and optional FPU. Quadra version increases speed up to 40%. ... see line listing.

- 1982 ⑦ Scanmaker 1850S ... 1999.

- 4505 ⑦ Truelaser (with toner) ... 1399.

Monster Design Group

- MacSpeakers (two, stereo) ... 169.

★ Mouse Systems ... 30 day MBG

- ⑦ Little Mouse or ⑦ Little Mouse Plus ea. 74.
- 3005 ⑦ A³ Trackball (ADB) ... 79.

★ Orange Micro ... 30 day MBG

- 3036 ⑦ Grappler 2.0 ... 92. 6229 ⑦ LX ... 111.

★ Sophisticated Circuits ... 30 day MBG

- 8009 ⑦ PowerKey 2.01 ... 76.
- 8008 ⑦ PowerKey Remote ... 32.

Thunderware

- 4994 ⑦ LightningScan 400 ... 359.
- 3107 ⑦ LightningScan Pro 256 ... 499.

★ Tripp Lite ... 30 day MBG

- 3350 MacDirector (5 outlets & modem protection) 72.
- 6200 IB-6 (6 outlets, Gold Seal Warranty) ... 59.

UPGRADES & DRIVES

MEMORY, ACCELERATORS

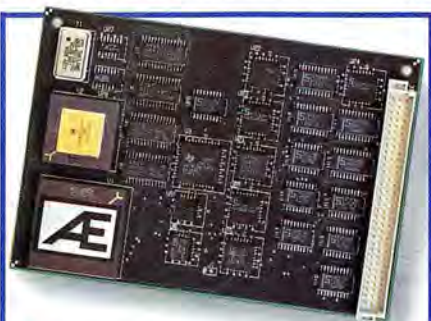
SIMMs ... with free video & manual

- 8316 1 MB SIMMs (80ns, set of 2) ... 79.
- 9437 2 MB SIMMs for IIsi or II LC ... 79.

PowerBook memory ... call

★ Applied Engineering ... 30 day MBG

- 2532 QuickSilver Accelerator for the IIsi ... 299.



★ Applied Engineering ... 30 day MBG

Experience a new world of LC speed with TransWarp LC. At 33 MHz you'll get up to three times the speed of the standard LC.
4147 TransWarp LC (33 MHz) ... \$999.
4903 TransWarp LC (40 MHz) ... 1199.

- 1971 FastMath LC ... \$139.
- 4850 FastMath Classic II ... 169.
- 8361 ⑦ 1.44 MB High Density Drive ... 229.
- 5290 ⑦ Plus Drive (FDHD for Plus & SE) ... 309.
- 3319 TransWarp SE (25 MHz) ... 799.
- 3317 TransWarp SE (40 MHz) ... 1475.
- 4147 TransWarp LC (33 MHz) ... 999.
- 4903 TransWarp LC (40 MHz) ... 1199.

Computer Care

BookView Imperial (memory and video card for Apple's PowerBooks) ... call

BookRAM 2S, 4S, 6S, DRAM 4 ... call

★ Dayna ... 60 day MBG

- 8722 DaynaFile II 1.2 5 1/4" Drive ... 429.

★ DayStar Digital ... 30 day MBG

Does not include optional math chip.

- 8949 LT200 Connection (PC) 175. 8950 (MC) 279.
- 3584 DualPort IIsi with 20 MHz 68882 ... 165.
- 8556 ⑦ FastCache for Mac IIsi ... 265.
- 3401 ⑦ FastCache IIsi ... 299.
- 3389 ⑦ FastCache IIsi with FPU ... 369.
- 1613 ⑦ FastCache 040 (for Quadra) ... 349.
- PowerCache for SE/30, II, IIsi, ILCx, IIsi, LC 40 MHz ... 899. 50 MHz ... 1399.
- RAM PowerCard (various memory config.) ... call



Envisio

NoteBook Display Adaptors—1991 MacUser Editors' Choice Award for Best Display Product. Connect your PowerBook to Apple and VGA compatible displays and projection devices with up to 256 colors. ... see line listing.

Envisio

- 1819 Notebook Display Adaptor (1 MB) ... 549.
- 1812 (2 MB) ... 699. 1842 (4 MB) ... 1099.
- 1848 Notebook Display Adaptor 030 (1 MB) ... 629.
- 1837 (2 MB) ... 939. 1835 (4 MB) ... 1249.

Dove Computer

- 9788 Racer 030 for Plus ... 399.
- 9790 Racer 030 for SE ... 399.
- 9789 Racer 030 for Mac II ... 739.

★ FWB, Inc. ... 30 day MBG

- 2320 HammerDisk44 (removable) ... 739.
- 1802 HammerDisk88 (removable) ... 999.
- 2331 PocketHammer 50 ... 569.
- 2329 PH 100 ... 769. 2314 PH 200 ... 1199.
- 1801 Hammer300 ... 1899. 1803 PH 425 ... 2199.
- 2341 Hammer Internal 50is ... 389.
- 2333 100is ... 599. 2334 200is ... 999.
- 1795 300is ... 1699. 1794 425is ... 1999.

IOMEGA

- 2224 90 MB Portable (reqs. kit) ... 799.
- 2467 Gold Std. Rem. Disk (90 MB, tri-pak) ... 439.
- 7789 ⑦ Mac 1B Interface (w/Central Pt. Backup) 39.
- 2466 ⑦ Mac 2B Interface (w/RetroSpect) ... 99.

Mass Microsystems

- 2605 DataPak 45 ... 649. 2599 DataPak 88 ... 849.
- 2973 Diamond 120 MB Hard Drive ... 139.
- 2972 Diamond 210 MB Hard Drive ... 1049.
- 2969 Diamond 320 MB Hard Drive ... 1699.
- 2952 Diamond 510 MB Hard Drive ... 2149.

Dove Computer

9634 ⑦ DoveFax Plus 2.0—Now System 7 compatible! Combines 3 popular office machines into one small package. 2400 bps modem/9600 bps send/receive fax will also answer your phone and allow users to leave voice mail. ... \$395.

GDT Softworks

- 3429 ⑦ BetterWriters 1.0 (software drivers) ... 39.
- 6256 ⑦ PrintLink Collection/Serial 4.0.1 ... 59.
- 8959 ⑦ PrintLink Collection/Parallel 4.0.1 ... 139.
- 6151 ⑦ JetLink Express/Serial 2.1 ... 89.

Hewlett-Packard

- 6514 HP B&W DeskWriter (w/cartridge) ... 479.
- 2964 HP Color DeskWriter C (w/color cart.) ... 849.
- 3596 HP ScanJet IIsi (color) ... 1599.

★ Kensington ... 30 day MBG

- 2547 ⑦ Turbo Mouse 3.0 ADB ... 107.

Koala

- 2593 ⑦ MacVision Gray-Scale Digitizer 3.5 ... 259.
- 2879 ⑦ MacVision Color Digitizer 1.1 ... 499.

★ Logitech ... 30 day MBG

- 1671 ⑦ MouseMan ... 77. 1672 ⑦ TrackMan ... 89.
- 5082 ⑦ ScanMan Model 32 G-Scale Scan ... 299.

★ MicroSpeed ... 30 day MBG

- 2807 ⑦ MicroTRAC (for SE & II family) ... 75.
- 6621 ⑦ MacTRAC ADB 2.0 (SE & II family) ... 75.

★ Microtek ... 30 day MBG

- 1981 ⑦ MS-II OCR Scanner ... 849.
- 1978 ⑦ Scanmaker 600GS ... 849.
- 1985 ⑦ Scanmaker 600ZS ... 1449.



Gallery Effects lets you select a portion of an image to quickly preview the effects of a particular filter.

effect's look in subtle or substantial ways by setting up various parameters. Up to 25 custom setting combinations can be saved for each filter.

Although some of GE's effects, such as emboss, ripple, and film grain are similar to those created with other image-manipulation programs and some effects are easy for savvy Photoshop or ColorStudio users to duplicate, GE's appeal is that the effects are only a click away for even the most fumble-fingered aspiring artist.

Animator, a bonus application that should be included in the GE package by the time this review appears, was still in beta form at press time. Animator is a SuperCard-based interface for XCMD versions of the filters. You can use Animator to process a PICS file with a GE filter, and the program even lets you interpolate filter settings in a selected frame range (sorry, you can't interpolate among different filters).

The Bottom Line

Desktop publishers and artists will find Gallery Effects a useful, if not a downright fun, addition to their existing electronic palettes. When you combine it with other filters and effects in Photoshop and Digital Darkroom, you can easily extend the potential range of GE effects to new vistas.

— David Biedny

Get Info

Aldus Gallery Effects

Published by: Aldus/Silicon Beach Software, 9770 Carroll Center Road, Suite J, San Diego, CA 92126; (619) 695-6956.

Version: 1.0.

List Price: \$199.

SCANNERS

HP ScanJet IIc

Top-notch hardware teamed with innovative software makes HP's new color scanner a winner.

Achieving a good-looking color scan the first time around has been more wishful thinking than a reality for most users of affordable color scanners. Until now, that is. The new HP ScanJet IIc, with its winning mix of well-designed hardware and innovative software, helps you get a near-perfect match between what goes into your scanner and what comes out of your printer, on the first try.

Winning Combination

To test the HP ScanJet IIc, we used the same set of tests we used for our most recent color-scanner lab report ("Capturing Color: 24-Bit Scanners," December '91, page 152). The results showed HP's new scanner to be the best in its class in both hardware and software.

The ScanJet impresses from the moment you open the box. Other scanners use a removable screw that locks the scan head for shipping, but HP uses a locking lever that's built in to the scanner itself. There's no screw to lose, and the lever is so easy to use that you'll find yourself locking the scan head more often, thereby increasing its life span.

The bundled DeskScan II scanning software comes with an excellent installer, similar to the Apple system-software installer. The HP model is smart enough to install the proper scanning software for the system you're using — System 6 or 7.

For those who encounter problems during scanning operations, HP's on-line help is among the best we've seen, and the

manual offers a variety of useful tips.

HP also bundles Zedcor's DeskPaint DA, but its minimal image-retouching abilities are a far cry from those offered by a true image-manipulation program such as Adobe Photoshop. In fact, the most glaring fault of HP's package is its lack of a plug-in for Photoshop or ColorStudio. This would be totally unforgivable, were it not for DeskScan II's excellent calibration ability, which allows it to fill in quite handily for Photoshop's and ColorStudio's image-tweaking tools. However, the software doesn't compensate completely for the lack of a plug-in, because some users may want to use Photoshop or ColorStudio to create special effects, and the bundled software can't fill the gap.

In its favor, DeskScan II makes the calibration process a breeze. Using your favorite graphics application, you save the calibration targets provided with the package as files and print them. One target consists of gray swatches, for black-and-white printing, and the other of colored swatches, for color printing. You print both targets if you're using a color printer.

You then scan the printed targets, and DeskScan II creates a calibration for your printer. If all goes well, you're almost guaranteed a scan that's perfectly matched to your printer.

We used DeskScan II to create calibrations for a QMS ColorScript 100 Model 30 (a PostScript thermal-wax-transfer color printer) and then scanned



The HP ScanJet IIc is tops in its class for fast, affordable color scanning.

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You can even rotate text in one-degree increments.

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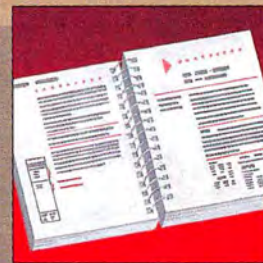
Complete Word Processing

A 112,000-Word Spell Checker and 240,000-Word Thesaurus protects you from "typo-itis".



Slide-Show Feature

Dazzle your audience with dynamic slides, handouts, even on-screen presentations.



72 Sample Layouts

Professionally drawn layouts give you the creative edge.

TIMEWORKS

* Not compatible with Macintosh 128K or 512K machines. Publish-It! is a trademark of Timeworks, Inc. © 1989, 1992 Timeworks, Inc. & Foton Corp. All Rights Reserved.

CIRCLE 114 ON READER SERVICE CARD.



With HP's DeskScan II scanning software, it's possible to get near-perfect results with the first scan. Calibration techniques boost image quality dramatically: The image at left was produced without calibration, the image at right with calibration.

two color photos plus a Kodak Q60 color test target. We also tried scanning the images without calibration. The printed results showed dramatic improvements in image quality with calibration.

Too Many Cooks

We also tested calibration with the Tektronix Phaser IIIPXi, a PostScript Level 2 phase-change color printer. This time around, however, the results were a bit problematic. The printed image of children's faces from a scanned photo had an odd color cast due to the combination of the scanner's calibration, the Phaser's own built-in calibration, and PostScript Level 2's calibration. Without a way to integrate these various color-calibration schemes among scanners, applications, and printers, users may encounter idiosyncrasies with some printing devices.

DeskScan II also provides several image-adjustment controls. A convenient exposure feature automatically adjusts scans to accommodate ranges in highlights and shadows. You can also manually select highlights and shadows as well as adjust hue and saturation and create custom tonal curves. Adjusting the settings for brightness, contrast, and size, however, is a bit awkward. The software provides sliding markers that are hard to set at exact values.

HP combines its excellent color-calibration technology with one of the best scanning engines we've seen. Our tests for resolution, consistent tracking of the scan head, and color accuracy showed the HP ScanJet IIc to be a top performer. In

addition to scanning at an optical resolution of 400 dpi, the ScanJet can also interpolate to a resolution of 1,600 dpi, which is especially crucial for scanning detailed line art.

The 400-dpi resolution is a plus for OCR operations. HP plans to offer a \$695 automatic sheet feeder — a must for any serious OCR work — which should be available by the time you read this.

The HP ScanJet IIc uses a one-pass scanning method that makes it one of the fastest color scanners we've seen. It also provides time-saving color previews that dynamically display any changes you make to the scan, such as exposure, hue, and saturation modification.

The Bottom Line

The HP ScanJet IIc sets a new standard for affordable color scanners. Its engine is fast and well engineered, and HP's innovative color-calibration software makes hassle-free, "true"-color scans a reality. Priced at less than \$2,000, the HP ScanJet IIc is a best buy in its class.

— Paul Yi

Get Info

HP ScanJet IIc

††††½

Manufactured by: Hewlett-Packard Co., 19310 Pruneridge Avenue, Cupertino, CA 95014; (800) 752-0900.

List Price: \$1,995.

UTILITIES

Help!

This new diagnostic tool does a great job of flagging incompatibilities and conflicts in your Mac's system.

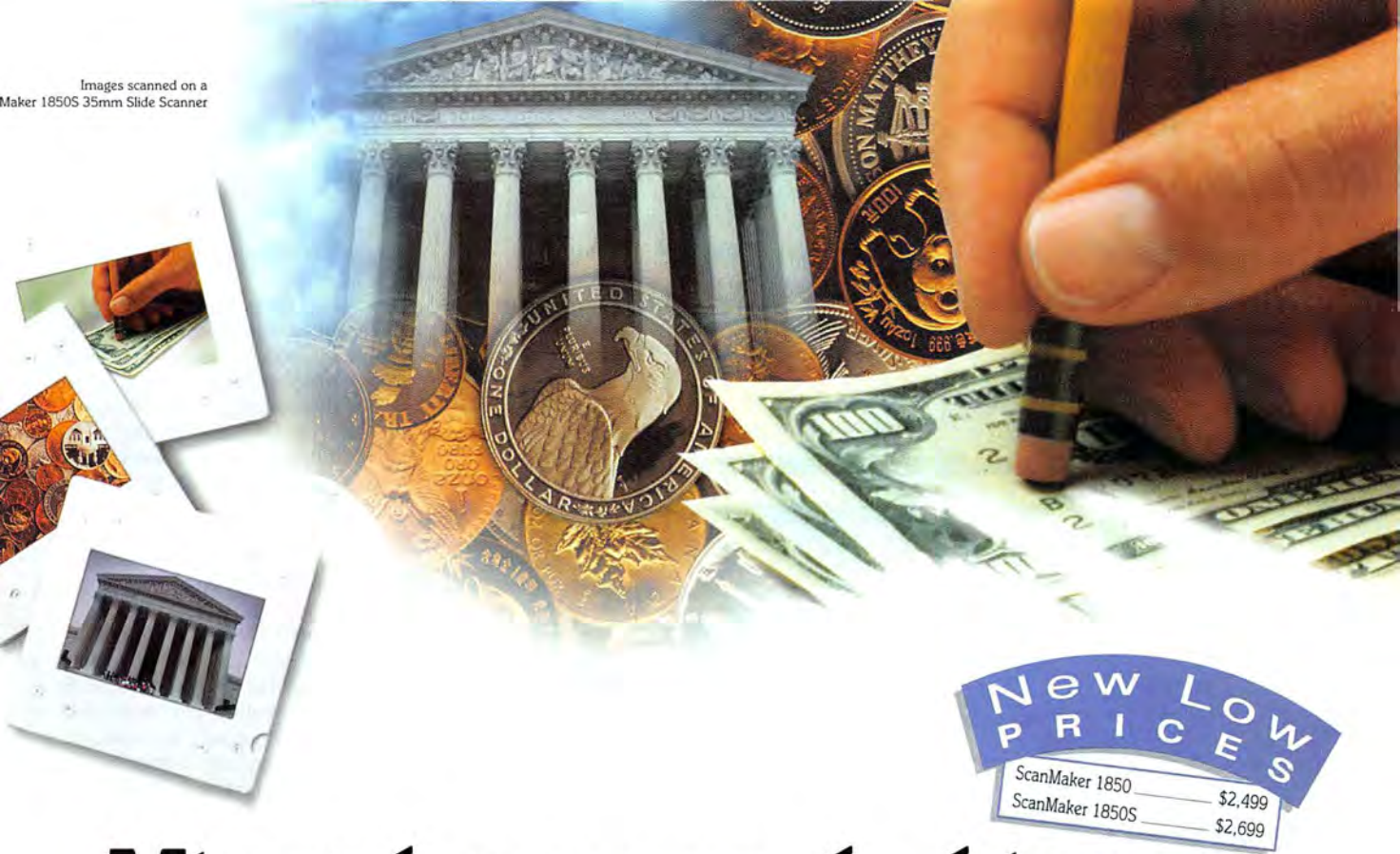
If you're leery of the compatibility problems stemming from the move to System 7, are perplexed by the contents of your System Folder, or are just trying to track down an annoying INIT conflict, there's no need to fret. Help! is on the way in the form of a new software program called — you guessed it — Help!. This technical-support software not only analyzes systems and highlights potential problems but it can also suggest possible solutions to whatever may be ailing your Mac.

Undergoing Analysis

After launching Help!, you use a dialog box to select the volumes you want to analyze. Help! creates the appropriate report, which may include an analysis of one or more hard drives, servers, or floppy-disk drives. You can analyze your present configuration or find out how it would react to changes in the startup volume or system software. Choosing one of eight simulated system versions gives you a glimpse of any problems that may occur as you switch from System 6 to System 7 or to any of the interim system releases.

Depending on your Mac's configuration, Help! takes a minute or two to generate a report. When it's finished, a portion of the report is displayed on-screen, where you can peruse or print it. Using Help!'s unique pop-up menus located at the bottom of the program window, you can quickly jump to the contents that most interest you. A full report contains separate configuration and diagnostic sections, which are broken down into 17 subjects. You can omit items to create custom reports.

The Configuration section of Help!'s report contains detailed information about your System Folder, applications, fonts, DAs, drivers, system settings, SCSI



Microtek removes the biggest barrier to owning a Slide Scanner



If price has been the barrier separating you from high quality color scanning, take a look at the ScanMaker 1850.

Another stunning price breakthrough from Microtek,

the leader in affordable color scanning solutions.

The ScanMaker 1850 sports a formidable set of specs. 35 x 35mm scanning area. 24-bit color. 8-bit gray-scale. 1850 dpi resolution.

Best of all, it's so easy to use. Just drop in any slide and you're ready to start scanning.

The ScanMaker 1850 gives you everything you need to go from comps to final color separations. It even comes bundled

with PhotoStyler for the PC or Adobe Photoshop for the Mac.

But wait, it looks even better when you see the price. Just \$2,499 for the ScanMaker 1850 on the PC. And only \$2,699 for the Mac compatible ScanMaker 1850S.

Call 1-800-654-4160 or 213-321-2121 in California for the name of the

Microtek authorized dealer nearest you.

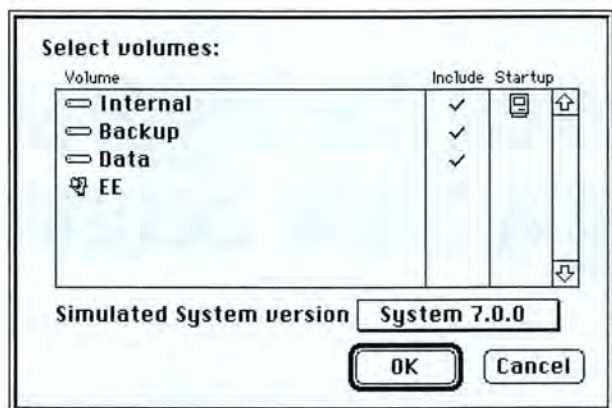
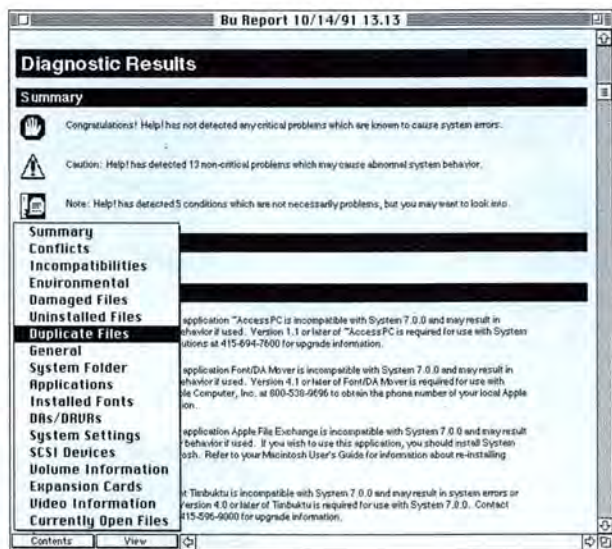
Because the only barrier between you and a 35mm color scanner now is a toll-free phone call.



The ScanMaker 1850 is just one member of a whole family of affordable desktop peripherals available from Microtek.



MICROTEK
Better Images Through Innovation.



devices, storage volume, expansion cards, video, and open files. This is similar to the information provided by Ken McLeod's MacEnvoy freeware control panel (available on ZiffNet/Mac) and Now Utilities' Profiler application.

Tracking Down the Problem

The configuration information tends to be quite technical; the Diagnostics section, on the other hand, is more practical for tracking down potential problems. Damaged, uninstalled, and duplicated files are identified, but it's up to you to fix, install, or delete them, using a program such as Norton Utilities for the Macintosh or SUM II.

Although Help! doesn't fix the problems it detects, it consults its extensive Knowledgebase and offers suggestions on how to resolve critical situations, conflicts, and incompatibilities. The

Knowledgebase contains rules culled from testing labs, developers, on-line discussions, and Apple's Compatibility Checker. Rules can specify that one INIT needs to load before another, for example, or that an application's Help file must be in a particular folder. Rules are the heart and soul of Help!. The Knowledgebase currently contains 2,500 rules, and Teknosys plans to add roughly 1,000 new rules per quarter on a subscription basis.

When Help! identifies an incompatibility, it displays the name of the problem file, briefly explains the nature of the conflict, and suggests a course of action (usually "contact the publisher for an update"). Publishers' telephone numbers are listed, but the information would benefit greatly from the addition of fax numbers as well as local numbers when only toll-free numbers are given (toll-free lines are often extremely busy and are

Help! is a powerful diagnostic tool for your Mac. The program's well-organized reports document system incompatibilities, analyze their source, and identify potential problems. Here, a pop-up menu makes it easy to locate specific system information within the report.

notoriously inaccessible from outside the U.S.).

Most of the incompatibilities listed by Help! are of the generic "this program is incompatible and may result in system errors or irregular behavior" variety. In practice, the majority of these tagged programs work just fine. The only problem is that they're outdated and Help!'s Knowledgebase rules pertain to new versions of the programs only. Teknosys is in the process of adding more rules to the Knowledgebase and rewording error messages to eliminate this ambiguity.

The Bottom Line

Although Help! can't fix an ailing system, it's the best tool we've found to date for spotting problems and identifying their sources. Moreover, its simulated system software provides a great way to flag prospective problems before you move to System 7. As its Knowledgebase grows, Help! promises to become an invaluable diagnostic tool, especially if it receives support from developers. Some additional features we'd like to see in future versions are user-defined rules and automated corrective action for identified problems. Even so, the current version of Help! leapfrogs Apple's Compatibility Checker and runs rings around competitors such as Baseline Publishing's INIT-Info Pro, a \$70 HyperCard stack that consists primarily of unsubstantiated bug reports drawn from on-line discussions.

By contrast, Help! reports are consistent and are formatted in a useful and attractive layout. Overall, Help! is an impressive technical-support program that belongs in the shirt pocket of every Mac MIS administrator. Individuals may need Help! only periodically, but it can shed light on a variety of mysterious system misbehaviors.

— Owen W. Linzmayer

Get Info

Help!

Published by: Teknosys, Inc.,
3923 Coconut Palm Drive, Suite
111, Tampa, FL 33619; (800)
873-3494 or (813) 620-3494.

Version: 1.0.

List Price: \$149; quarterly
Knowledgebase updates plus any
program updates, \$75.



Wacom SD-420L
Wacom Inc.



MacUser
June 1990
SD-510

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**"The better the tools,
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That's how a successful artist explained it when asked why he

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Now you can use pressure with Adobe Photoshop, ColorStudio 1.1, Digital Darkroom 2.0, Easy Color Paint 2.0, Fractal Design Painter, Pixel Paint Professional 2.0, Studio/32, Time Arts Oasis and more.

A Wacom pen is a joy for artists. It is ultralight (just 1/3 ounce as there are no batteries or magnets) and very natural and responsive since there's no cord to hinder your freedom.

Vector Drawing. You don't need pressure to benefit by using the Wacom Tablet. Many artists are discovering they can draw faster and more naturally with vector programs such as FreeHand and Illustrator as well as Fontographer.

New. Pressure-sensitive Vector Drawing. Now, with Aldus FreeHand 3.1 and the Wacom Tablet, graphic artists also can use hand pressure to vary the line widths of strokes drawn with the freehand tool.

Isn't it time you, too, benefited from using the Wacom Tablet?

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The Wacom Tablet is available in sizes 6" x 9", 12" x 12" and 12" x 18".

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CIRCLE 149 ON READER SERVICE CARD.

FINANCIAL MANAGEMENT

MacInTax

ChipSoft's new package combines the best of MacInTax and TurboTax to help you over the hurdles of tax-form preparation.

If you're dreading the drudgery of tax-form preparation (and who isn't?), the new MacInTax is guaranteed to make your April a lot brighter. The package won't pay your tax bill, but it will do practically everything else. A hybrid of ChipSoft's TurboTax and SoftView's previous version of MacInTax (ChipSoft acquired SoftView in 1991), the program combines MacInTax's WYSIWYG forms with TurboTax's interview and consulting features. The result is a program that expertly guides users through the process of preparing all but the most complex tax forms.

No More Guesswork

If you've used previous versions of MacInTax, the first new feature you'll notice is Logical Next Step, a series of helpful pop-up notes that offer suggestions on what to do next. These helpful reminders take the guesswork out of using MacInTax, virtually eliminating the need to read the manual. You can stop and start this feature as needed or turn it off completely if you're an experienced user.

Veteran users can go right ahead and enter tax information directly into the program's forms (more than 90 are provided), statements, and worksheets; check

for completeness; print the forms; sign them; and mail them. All types of 1040 forms are supported, from the 1040EZ to the full set.

For those who need a little more guidance, MacInTax offers several levels of help, including Balloon Help for System 7 users. The program's Interview with MacInTax help feature, taken directly from TurboTax, is especially useful. It asks questions much like those you would expect from any knowledgeable tax preparer. Combined with the program's next-step advice, the interview process takes you painlessly through all the forms you need to complete.

Two other key help functions are Consult with MacInTax, which explains in layman's terms how to fill out individual forms, and actual IRS instructions taken from IRS booklets. Both context-sensitive functions are available to you at any time as you fill out your forms. You can select them as well as the Interview with MacInTax help feature simply by clicking on the selections in a handy new status bar

HIGH RESOLUTION IS JUST

PERSONAL TYPESETTERS



- ▶ 1200 and 1000 dpi plain-paper output
- ▶ Letter, legal, A3, A4, and 11" x 17" at up to 20 ppm
- ▶ 135 premium Type 1 fonts
- ▶ RISC-based processor provides unmatched speed
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LaserMaster's 1200 and 1000 Personal Typesetters offer Macintosh® freedom at an affordable price. Freedom from the expense and hassle of service bureaus. Freedom from paper size limitations and limited typeface choices. Freedom from unproductive down-time while you wait for your printer to print. And with camera-ready copy at just pennies a page, you'll see savings just as quickly as your printed page.

POWERFUL NETWORK PRINTING



- ▶ Powerful 400 dpi printing for your entire office
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Increase resolution, decrease delays, and add flexibility to your company's Macintosh network with a LaserMaster 400XL printer. The 400XL's RISC-based processor dramatically increases print speed, while its powerful engine handles the heavy printing demands of your entire networked work group. And its paper flexibility is great for newsletters, posters, spreadsheets, CAD drawings, and bleeds.

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- ▶ 135 premium Type 1 fonts
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With the LaserMaster 800 and 800/4, LaserMaster has harnessed its patented TurboRes technology to create powerful high-resolution business printers that will make your reports dazzle, your presentations sparkle, and even your most basic correspondence easier to read. Best of all, you can get high-performance 800-dpi Macintosh printing for the same price as a regular 300 or 600-dpi laser printer—or less.

that's located at the top of the screen.

Additional options, such as itemization worksheets for particular line items, are also readily available from the status bar. One especially handy option, Cross Reference, tells you which form, schedule, or worksheet is the source for any given line item.

Finally, a What's New file documents not only what's new in MacInTax but also what's new in the tax laws for 1991.

MacInTax can import data from other applications by using the tab-delimited data format. A conversion option lets you transfer Intuit's Quicken files into MacInTax as well. Once you've begun entering data, you'll discover a wealth of other valuable features. One of the best is an Option/Return-key combination that instantly locates lines in your return that have yet to be filled in as well as those with questionable values, errors, or overrides. That means that you can purposefully enter estimated or questionable data (noted by an e or ? following the number) as you're going through the return and then quickly

The new MacInTax is a winning marriage of the WYSIWYG forms of the previous version of MacInTax to TurboTax's excellent built-in consulting features.

ONE OF THE ADVANTAGES.

AFFORDABLE PRINTING POWER

MaxWriter 400
\$2,195

ENHANCE YOUR LASERWRITER

LaserMaster 800KLW
\$2,695

Sure, LaserMaster printers and personal typesetters give you the unsurpassed high-resolution PostScript output that has made us famous. But that's just one of the advantages of our high-performance printing machines.

To learn more about how you can harness LaserMaster's speed, flexibility, and creativity for all your Macintosh II printing needs, call us today at:

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More: Speed, Fonts & Resolution™

Yes! All text was printed on a LaserMaster Personal Typesetter.



- ▶ 400 dpi resolution in a desktop machine
- ▶ Host-based architecture
- ▶ Unmatched affordability
- ▶ 50 premium Type 1 fonts
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Don't let a tight budget limit your choices of a high-performance laser printer. The MaxWriter™ 400 provides nearly twice the resolution of standard 300-dpi laser printers at an amazingly affordable price. And while the MaxWriter 400 is small enough to fit on your desktop, it gives you the speed, font versatility, and paper flexibility usually found only in bigger, more expensive printers.

- ▶ 800 dpi from your current laser printer
- ▶ RISC-based processor accelerates print speed
- ▶ Six megabytes of high-speed memory
- ▶ 50 or 135 premium Type 1 fonts
- ▶ Complete PostScript language compatibility

LaserMaster's 800KLW controller transforms your existing LaserWriter™ II into a printing powerhouse. From delicate serifs to intricate halftones, every detail of your printed documents will benefit from improved 800-dpi quality. And with its additional memory and specialized processor, you get the power to tackle your most complex PostScript documents fast.

CIRCLE 178 ON READER SERVICE CARD.

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MACINTOSH SE	*						
MACINTOSH SE/30	*						
MACINTOSH II	*			*			
MACINTOSH IIX	*			*			
MACINTOSH IICX	*			*			
MACINTOSH IICI	*	*		*		*	*
MAC CLASSIC	*		*				
MAC CLASSIC II	*	*		*			
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LASERWRITER IINTX	*						
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QUADRA 700	*			*			
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MACINTOSH IISI	ADAPTER CARD - ADAPTER CARD WITH FPU						
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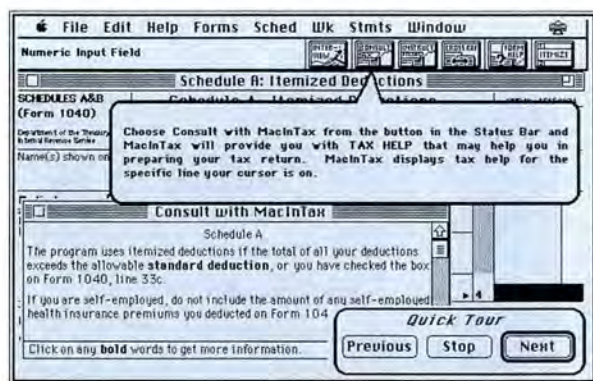
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CIRCLE 105 ON READER SERVICE CARD.



The Consult with MacInTax feature explains how to use each form on-screen.

The Bottom Line

By combining MacInTax with TurboTax, ChipSoft has come up with a winner. No matter what your level of tax-preparation expertise, MacInTax is the answer for all but the most complex returns. And if you are lucky enough to be a resident of one of the 15 states supported by MacInTax's state-tax series (which includes California, Illinois, Massachusetts, New York, and Pennsylvania), you may never again shorten both ends of a pencil filling out a tax return.

— Becky Waring

find the incomplete items and type in the proper values at a later date. The program also indicates incomplete forms by displaying them in outline type in the menus.

When your form is complete, MacInTax's Final Review suggests ways to save tax money based on the information in your return. The program also checks returns for entries that may trigger an IRS audit and alerts you to them. Additionally, the package provides a final checklist, a

list of offices where you can obtain IRS publications, and addresses for submitting your return.

You may submit forms printed with MacInTax (using either a dot-matrix or laser printer) directly to the IRS or instead submit files electronically through Nelco, a third-party preparer ([414] 339-1040).

Owners of TurboTax or the previous version of MacInTax can upgrade to the new MacInTax for \$49.95.

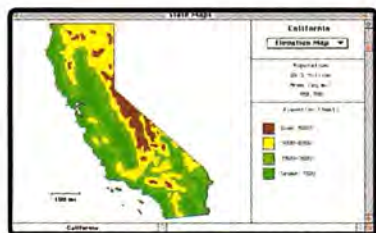
Get Info

MacInTax

★★★★½

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On average, the RealTech Laser performed 4 to 5 times faster than other PostScript® laser writers in its price range.



Visibly faster. The RealTech laser printers' high performance Weitek RISC processor prints complex documents 4 to 5 times faster than other non-RISC laser writers in their price range. ATM font rendering technology builds raw type characters 4 to 5 times faster. The RealTech uses a new version of the Sharp printer engine that prints 9 pages per minute.

Based on Adobe PostScript® Level 2...

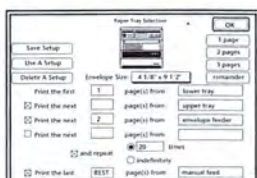
the next generation of Adobe's page description language, which has become the industry standard for defining pages of integrated text and graphics. It contains a number of performance, function and print quality enhancements that save printing time and improve quality. PostScript® Level 2 is compatible with all current application software that supports the PostScript® language. In addition, PostScript® Level 2 offers new capabilities, including forms handling, graphic patterns support, and new half-tone algorithms.



Elimination of fragmentation =
memory allocated dynamically
and automatically reclaimed

Genius-level memory.

One pool of memory is available for all resource needs. Memory is dynamically allocated and automatically reclaimed; no arbitrary memory restrictions exist. Disk space management is improved to eliminate fragmentation and improve transfer of information from the hard disk to RAM.



You can specify up to 4 paper changes from the menu — without ever leaving your chair!

2 paper trays included.

An ideal choice for multi-user printing environments. Includes two 250-sheet cassette feeders as a standard feature. Optional envelope feeder available for RealTech only.

500% FASTER than non-RISC printers

- RISC processor
- 2 paper trays
- 9 pages/minute
- SCSI port

\$1995

RealTech Laser

HOW REALTECH STACKS UP

PERSONAL LASER PRINTERS

	RealTech Laser	Apple LaserWriter IIx	Qume CrystalPrint Publisher II	Texas Instru. PS35	GCC BLP11s
Price	\$1995	\$3999	\$2995	\$1995	\$2899
Pros	Weitek RISC processor	Motorola 68020	Weitek RISC processor	Motorola 68000	Motorola 68000
	9 ppm 8.5x11	8 ppm 8.5x11	6 ppm 8.5x11	9 ppm 8.5x11	8 ppm 8.5x11
	2nd paper tray	—	—	Optional 2nd paper tray	—
	300 dpi	300 dpi	300 dpi	300 dpi	300 dpi
	SCSI port	SCSI port	—	—	SCSI port
	2 mb RAM (+10*)	2 mb (+32*)	3 mb (+6*)	1.5 mb (+4.5*)	1 mb
	PostScript Level 2	PS Level 2	—	PS Level 1	Quick Draw
Cons	Only available through	Very expensive	Expensive	Slow for graphics	Expensive
	HARDWARE THAT FITS	No 2nd paper tray	No 2nd paper tray	No SCSI port	No 2nd paper tray
	1-800-972-3018	—	No SCSI port;	Limited to 6 mb RAM	—
	Optional env. feeder \$269	—	PS clone	Optional paper tray \$199	Not PostScript compatible
	—	—	—	Optional env. feeder \$269	—

* = upgradable

HARDWARE THAT FITS

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(Please.)

**RealTech laser printers
come out on top in
performance, features,
AND price, every time.**

TWICE THE PRINTER!

400 dpi/11x17 printer

- **High-speed printing
(16 ppm, letter size)**
- **8 ppm (tabloid size)**
- **2 paper trays included!**
- **SCSI port**



**See our ad on
pages 174-179**

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**RealTech
Laser 400**

The ideal networking printers.

The RealTech Laser's (and Laser 400's) three interface ports (Appletalk® RS-422, IBM PC parallel, and RS-232-C) can be used simultaneously. They can be assigned either PostScript® or LaserJet II emulation, making the RealTech an ideal network printer. It switches automatically between interfaces and emulations, and spools files on a real-time basis. A Hewlett Packard LaserJet Series II emulation allows use with non-PostScript applications software.

SCSI port. The standard configuration includes a SCSI port and 2 Mb of RAM upgradable to 10 Mb (RealTech Laser) or 4 Mb of RAM upgradable to 16 (RealTech Laser 400).

Money-back guarantee. RealTech laser printers are backed by a one-year warranty. If you're not satisfied, we'll refund your purchase price, minus consumables.

Prices are subject to change without notice. Before returning merchandise, we must ask that you call our Customer Service Dept. to receive a returned merchandise authorization number (RMA). This number must be included with any printer you return. No C.O.D. returns, please. NOTE: Our ads are created entirely on Macintosh systems, from concept to film.

AGAINST THE COMPETITION

11x17 PRINTERS/HIGH-SPEED PRINTERS

	RealTech Laser	QMS 2210	Hewlett-Packard IIIsi
Price	\$4495	\$9995	\$6995
Pros	Weitek RISC processor	Motorola 68020	RISC-based formatter
	8 ppm 11x17	11 ppm 11x17	
	16 ppm 8.5x11	22 ppm 8.5x11	17 ppm 8.5 x 11*
	2 paper trays	Optional 2nd paper tray*	2 paper trays
	300 or 400 dpi	300 dpi	300 dpi
	SCSI port	SCSI port	
	4 mb RAM upgradable to 16	4 mb RAM	5 mb RAM upgradable to 17 mb
	PostScript Level 2	PS Level 1	PS Level 1
Cons	Limited supply	Very expensive	Expensive
	until 4/92	Limited to 300 dpi	Limited to 300 dpi
	1-800-972-3018	Poor paper handling	No 11x17 output; no SCSI port
		Slow for complex graphics; 4 mb RAM maximum * Optional paper tray \$115	* Optional double-sided printing costs \$695; not practical for most applications

1-800-972-3018

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GRAPHICS & DESIGN

Color It!

If you're looking for a color-image-enhancement program that won't empty your wallet, Color It!'s basic feature set may be just the ticket.

Although Color It!'s maker touts it as a 24-bit painting program, the program's real strength lies in image processing, a characteristic that distinguishes it from other comparably priced painting programs such as DeskPaint and Color Mac-Cheese. Color It!'s chief advantage is that it delivers basic color-image-enhancement features to casual users who don't require all the abilities of a program such as ColorStudio or Photoshop. Color It! lacks the color-correction tools found in high-end packages, and it can be less than intuitive to operate. But at \$119.95, the package is a solid value.

Do-It-Yourself Palettes

Color It!'s floating Tool palette holds a standard complement of painting tools. Because the tools are customizable, you can create an almost unlimited variety, and you have the freedom to position any combination of tools on the palette. Color It! also accepts plug-in tools and filters from programs such as Photoshop and Digital Darkroom. Customized Tool palettes are accessible from a pop-up menu.

You modify tools by using pop-up dialog boxes that contain modifier selections. The buttons that activate the dialog boxes reside on the Tool palette and are

context-sensitive, in that they relate to the selected tool. However, the buttons don't give you any visual feedback about which modifier you've selected. The entire pop-up dialog box blinks as you make selections. As a result, we often found ourselves returning to the dialog box to verify settings. The separate Brush Options palette holds five more modifiers, and the Paint Controls palette alters painting, pasting, and filtering operations. Color It! is not adept at paint mixing, however.

Because selections remain active and accept modification, Color It! excels at constructing complex selections. Although the tools — lasso, magic wand, and 11 marquee variations — are familiar, it's the modifiers that make the difference. The Grow/Shrink modifier lets you calibrate a selector's sensitivity to variations in pixel color. Toggle buttons let you add pixels to or subtract them from active selections. The Smooth Edges command cleans up a selection's perimeter, and the Feather option lets you paste a selection without hard edges, which is great for creating

STAY ON TRACK!

PRINT CENTRAL

What the AppleShare Print Server should have been! Print Central is the most flexible, complete network print server on the market today. Print Central combines unparalleled security with a series of features for the most demanding network. Whether you share one laser printer or a series of PostScript devices, Print Central is the product for you.

Print Central provides the means for defining up to eight Chooser selectable print queues. Queued jobs can quickly be prioritized or placed on hold, or sent to a different queue. Each queue can be sent to one or several printers on a first available basis. Since there is no limit to the number of users who can print their

jobs to the server, imagine never waiting for a printer again! Print Central maintains an accurate record of each job processed; the report can be printed in a variety of sorted formats.

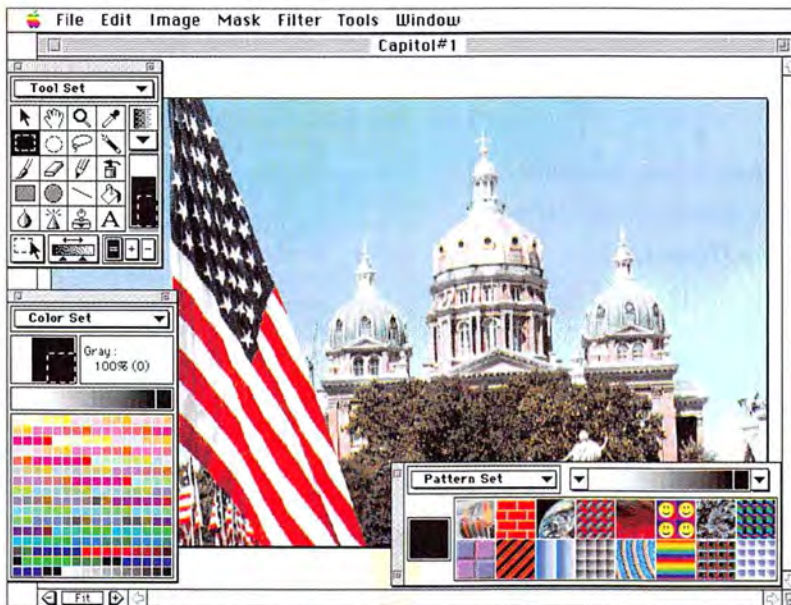
Security is an important aspect in a network of any size. Print Central can 'hide' printers and the administrator can define an authorized 'user list'. Add to this the ability to either check status or control the server from any Mac on the network, and you see the superior flexibility. Print Central works with all applications and is available from your local dealer or directly from Compumation. Stop waiting for your printers, stop your printers from waiting for the next job. Order Print Central today!

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24 HOURS

CIRCLE 249 ON READER SERVICE CARD.



Color It! is a low-cost painting program that offers a solid complement of basic color-image-enhancement tools.

vignette effects. You can even save your selections with TIFF images. When you reopen an image, the selection is active.

You modulate brightness and contrast filters with sliders in a dialog box that displays before-and-after thumbnails for fine-tuning. You can do image enhancement in real time with the thumbnail previews. Dialog boxes for calibrating color brightness and contrast by RGB values and for setting blur and sharpen effects also incorporate thumbnail previews. The Auto Contrast command lets Color It! enhance the image for you, with pleasing results, and you can apply all filtering effects to the program's 8-bit masks, facilitating the subtle blending of images.

Color Handling

Although Color It! does a good job of integrating patterns and colors, its color-handling techniques aren't always intuitive. You can create patterns directly or derive them from image segments, and the program lets you specify gradients in

It's a graphics program. It's a business program. Is not.

either the Color or the Pattern palette. But you can apply them only with the gradient tool. You can't paint a rectangle with a gradient fill, for example, or use the bucket to fill the rectangle with a gradient. Instead, you must draw the rectangle, select it, and then use the gradient tool to fill it. Otherwise, you'll find that the gradient tool applies the gradient over your entire document. When you're choosing colors in the Pattern palette, it's easy to inadvertently pick up whichever color is under the dropper when the Color palette pops up — another annoying characteristic.

Color It!'s text handling, on the other hand, is adequate, and the program offers extensive import and export capabilities. It supports the following formats: PICT, TIFF, PostScript, Paint, Photoshop, and GIF (CompuServe's image format). The program also provides several options for each format, including the ability to write TIFF in Macintosh or IBM formats. There are three built-in file-compression options. Printing options include several

types of dithered output as well as controls for halftone screens. Controlling scanners directly is possible with plug-in drivers.


The manual includes basic information about tools and menus, a tutorial, and a section that details error messages. Unfortunately, given the variety of tools and functions in the program, the manual lacks depth and clarity.

Color It! requires a Mac II or SE/30 with a minimum of 2 megabytes of RAM and System 6.0.5 or later with 32-bit QuickDraw. It's fully compatible with System 7. A color monitor and a 24-bit video board are recommended. For work with large files and multiple documents, Color It! implements its own virtual-memory scheme, which doesn't require System 7.

The Bottom Line

As computer images have become more photo-realistic, the distinctions between painting and image-processing programs have begun to blur. Color It! is

a good example of this trend. Its price puts it in a class with other low-cost painting programs, but it distinguishes itself from the field with a solid complement of image-enhancement features. Although it's clearly not the most intuitive painting program in its price range, its capable image-enhancement features make it an excellent value for users who don't require the high-end capabilities of Photoshop or ColorStudio.

— Carlos Martinez 

Get Info

Color It!

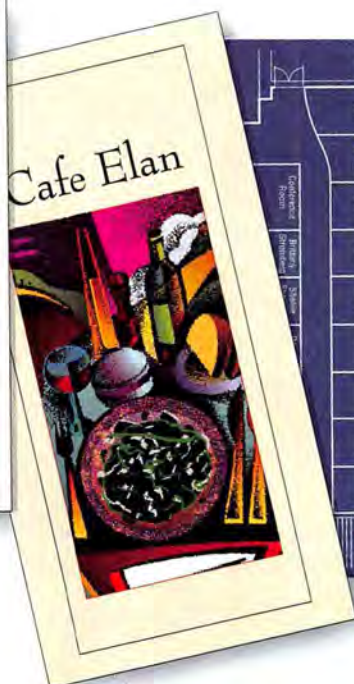
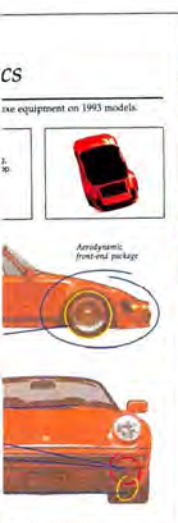
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Moines, IA 50322; (515)
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Version: 1.0.

List Price: \$119.95.

Is so. Is not. Is so.



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Let's put this argument to rest. It's both. SuperPaint® is the all-in-one program that makes it easy to do it all—combining paint, draw, and image enhancement—saving you time and money.

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File Edit Go Font Style

Macintosh Plus

Thursday, June 4

1. Start to restaurant.

2. Lunch.

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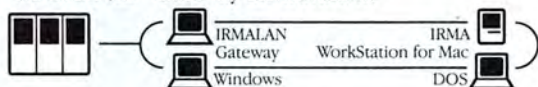


Until now, there was only one place to get a Mac to go with everything.

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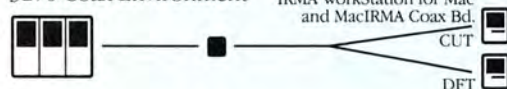
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IRMALAN/EP Gateway Environment

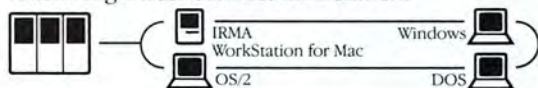


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3270 Coax Environment



Token-Ring Direct Connect Environment



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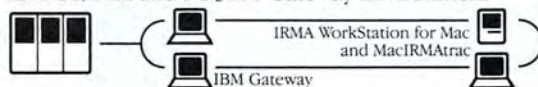
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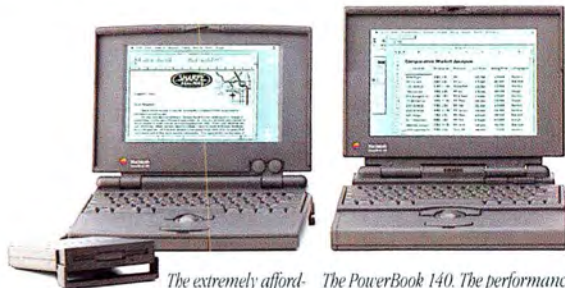
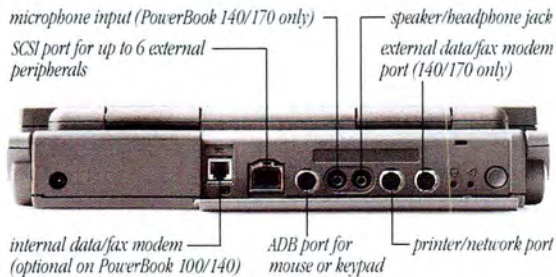
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CIRCLE 25 ON READER SERVICE CARD.





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PowerBook	Weight	Memory	Hard Disk	SuperDrive	Processor	Internal Modem
100	5.1 lb.	2MB	20MB	Optional ext.	16 MHz 68000	Optional
140	6.8 lb.	2/4MB	20/40MB	Internal	16 MHz 68030	Optional
170	6.8 lb.	4MB	40MB	Internal	25 MHz 68030/68882 coprocessor	Standard

All PowerBook models expandable to 8MB RAM.

PowerBook.



The PowerBook 170 lets you take the awesome power of a Macintosh IIci in your briefcase with room to spare.

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System 7 is standard equipment. So is a rechargeable battery that runs for up to three hours.

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You can retrieve files from the Macintosh in your den without leaving your hotel room. Or print an order form on a printer in your office without leaving your client's office. Or send e-mail from wherever you happen to be to anyone on your network.

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It's the freedom to work anywhere you want, anytime you want, in whatever way works best for you.

It's the new Macintosh PowerBook from Apple. It's the next thing.

It's the next thing.



PowerBook.

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It will let you run Macintosh software.
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It will let you run away.

It can talk to fax machines.
It can talk to computers.
It can talk.

It does more than you imagine.
It costs less than you think.

It's the next thing.



QUICK CLICKS



Multi-Ad Search



With today's gargantuan storage devices, graphics professionals can pretty much go hog-wild when it comes to accumulating graphics files. Organizing and finding those files, however, is not as easy as acquiring them. Enter Multi-Ad Search, a cataloging and retrieval system for graphic images.

Search's catalogs contain PICT miniatures of graphic images. These thumbnails are small in file size, so they don't consume vast amounts of disk space, but they maintain enough image quality to provide a recognizable representation of the original image.

A single Search catalog can contain as many as 32,000 images in a variety of formats, including TIFF, paint, EPS, PICT, or RIFF (ImageStudio). The program catalogs black-and-white and color images (up to 32-bit) and stores them in 8-bit format to save disk space. A double click on any thumbnail displays the image in full size in its own window. You can't edit images, but you can cut and paste them. Search keeps track of the size and location of original files and lets you search the database with user-defined keywords.

Because there's no immediate way to categorize or filter the unstructured data that makes up a graphics file, keywords play an important role in the cataloging process. In general, keywords are short descriptions that identify each graphic. Search accepts predefined keywords, such as those created by manufacturers of CD-ROM discs storing TIFF or EPS artwork as well as ones you create.

A unique aspect of Search is its Copy Reference command, a proprietary Clipboard format that saves disk space by copying a pointer to the original artwork without duplicating an entire image. To date, however, the only applications that recognize this format are QuarkXPress 3.0 and Multi-Ad Services' Multi-Ad Creator.

Search lets as many as 128 users access its catalogs simultaneously. It also provides a convenient way to catalog numerous images at once by letting you choose folders and subfolders for processing. Users can opt to print catalogs containing thumbnails, double-sized thumbnails, or the actual images.

Search has some drawbacks. It lacks sorting tools, and its fixed window doesn't let you take advantage of large monitors — you're limited to viewing six thumbnails at once. It also can't catalog proprietary formats, such as Photoshop's.

But these are minor shortcomings. Overall, Multi-Ad Search is ideal for DTP-program users who want to team a moderate-sized hard-disk drive (less than 100 megabytes) with removable media. For example, we easily created a 1.2-megabyte file on our hard disk that took less than an hour and a half to catalog 50 megabytes' worth of graphics files stored on an optical drive. If you deal with many graphic images, Search is an indispensable tool that can save you disk space as well as help you manage and access your files.

Multi-Ad Services, 1720 W. Detweiller Drive, Peoria, IL 61615; (309) 692-1530. Version 1.0. \$199.

— Dave Valiulus



SuperDisk!



SuperDisk! is one of the latest additions to the growing field of file-compression programs. Aylis, SuperDisk!'s maker, claims that its software is both faster and easier to use than competing packages, but our tests showed the company to be correct on only one count — speed.

SuperDisk! isn't designed to combine multiple files into a single compressed archive file for transmission by modem, as are StuffIt Classic/Deluxe and Compact Pro. SuperDisk!'s primary function is to save disk space by compressing files, which makes DiskDoubler its primary competition.

With SuperDisk! set to maximum compression and DiskDoubler 3.7 set to minimum compression, our tests showed SuperDisk! to be twice as fast as DiskDoubler at compressing the same file. However, the file compressed with SuperDisk! was still roughly twice the size of the file compressed with DiskDoubler and a whopping nine times as large as the same file compressed by Compact Pro.

Outwardly, the most noticeable difference between SuperDisk! and its competitors is SuperDisk!'s compression method — to compress a file, you simply add the extension .s to the end of the filename; to decompress a file, you delete the .s. You don't have to open an application, and no additional menus are

necessary on the desktop. Moreover, if you add the .s extension to a folder name, anything placed in the folder is automatically compressed.

Compressed SuperDisk! files look like and act in the same way as uncompressed files, and only a few seconds are added to the time it takes to open and close files that are being compressed or decompressed. SuperDisk! is suitable for use with applications as well.

A drawback of using SuperDisk! is the program's confusing control panel. In addition, the method for creating self-extracting files and folders is inconsistent with the program's other operations. Although self-extracting files are only a measly 7K larger than non-self-extracting files, you must use the program's control panel to create self-extracting files and folders. Too bad Aylis didn't model this function after the method for compressing files (simply adding an extension to filenames). This feature may be available by the time this review appears.

We commend Aylis for SuperDisk!'s innovative file-compression method, its speed, and the fact that SuperDisk! is a single control-panel file that doesn't use an application or extra desktop menu.

But SuperDisk!'s control-panel screen should be less confusing, the process of creating self-extracting files should be consistent with compression operations, and the program should be able to squeeze files even tighter for maximum disk-space savings.

Aylis Software Corp., 1231 31st Avenue, San Francisco, CA 94122; (415) 566-2263. Version 1.7. \$89.

— Darryl Lewis

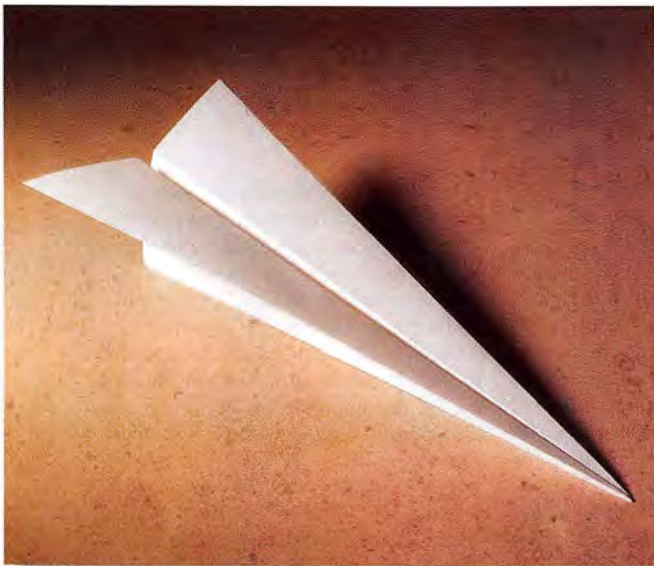


@Risk



Risky business is the focus of @Risk, a Microsoft Excel add-in that provides Monte Carlo simulation from within Excel 3.0. By adding risk-analysis functions and a new series of menus to the spreadsheet program, @Risk gives you an accurate picture of how even the most uncertain estimates and projections are likely to affect your business.

With @Risk, you can assign uncertain values to multiple worksheet cells. Simulation occurs when @Risk calculates the worksheet many times over, using different input values for those cells. You set up the simulation by using @Risk functions



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11" x 17" Laser Printer Market Snapshot

SPECIFICATIONS

Manufacturer/Model	Resolution (DPI)	Speed (PPM)/Processor	Page Description Language	List Price
Dataproducts LZR 1560	300x300 OR 400x400	15 Weitek 8200 RISC	Adobe PostScript Level 2 & PCL4	\$5,695
QMS PS2210	300x300	20 Motorola 68020	Adobe PostScript	\$9,995
LaserMaster 400XL	400x400	20 None	Microsoft TrueImage	\$9,995
Varietyer VT600W	600x600	7 Motorola 68020	Adobe PostScript	\$16,995
DEC PrintServer 20	300x300	20 N/A	Adobe PostScript	\$25,247
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in Excel formulas. @Risk provides sophisticated decision analysis thanks to 24 distributions, twice the number provided by its rival Crystal Ball.

After you run simulations, @Risk generates summary Excel worksheets that detail statistical information such as minimum, maximum, mean, and standard deviation for all output cells. In addition, @Risk produces simple Excel bar charts that show the complete distribution for any given output cell. For macro-specific calculations, an innovative @Risk procedure calls Excel macros for each iteration of the spreadsheet.

But despite @Risk's sophisticated analytical abilities, the program's implementation as an Excel add-in results in a performance and functionality trade-off with Crystal Ball. Although @Risk — unlike Crystal Ball — doesn't require you to run a stand-alone application, its performance is extremely sluggish. In addition, standard operations such as calling up menu items, creating graphs, and loading simulations are pretty slow, even on a Macintosh IIcx.

In comparison, for roughly half the price of the \$395 @Risk, Crystal Ball provides a far more elegant interface for selecting and defining probability distributions, and it has more-sophisticated charting options. But users must put up with the inconvenience of saving Excel spreadsheets as SYLK files and then importing them into Crystal Ball to run the simulations.

Keeping its strengths and weaknesses in mind, we give @Risk high marks for its sophisticated risk-analysis features. However, the program is seriously hampered by sluggish performance and its price tag is high compared with that of the competition. If price is not an issue and you're willing to trade speed for a tightly integrated environment that has more analytical ability, only then will you find @Risk a better choice than Crystal Ball.

Palisade, 31 Decker Road, Newfield, NY 14867; (607) 277-8000. Version M1.01. \$395.

— Jeffrey A. Steinberg



Azimuth, a cartographic powerhouse, teams sophisticated projection mapping with 2-D-CAD tools. Although many other mapping packages concentrate on data analysis, most fall short when it comes to

Azimuth's specialty — map annotation. Azimuth doesn't provide any data analysis, but it excels at creating good-looking reference maps. Cartographers will especially appreciate Azimuth's ability to map the globe by using any of nine standard cartographic projections.

Like traditional manual cartography, Azimuth uses sophisticated mathematical projections to map the 3-D globe to a 2-D paper surface. Because paper can't accurately display three dimensions without distortion, most of Azimuth's projections optimize one of three map variables — area, shape, or distance accuracy — at the expense of the other two. Azimuth's nine projections fall within three cartographic categories: Equal Area, for plotting area-oriented maps; Conformal, for maps that must preserve the shape of their elements; and Equidistant, for distance-accurate maps.

Besides doing basic projection mapping, Azimuth can create stunning pictorial perspective maps, using views located at certain points in space. The views can be at specific heights and at specific latitudes and longitudes. The resulting effect is similar to taking a picture from a Space Shuttle.

Azimuth uses a layering method that's similar to CAD packages', so users can create a map of a particular region and place a 3-D-style globe that centers on the region in a corner of the map.

Because Azimuth also supplies a sophisticated 2-D drawing component based on Graphsoft's MiniCad+, users can add and rotate text as well as select and modify cartographic objects (use lines to add highways or use polygons to add lakes, for example). You can add extra cartographic information by drawing it in by hand or by using a digitizing tablet.

The package, which includes outlines of the countries of the world and all the states in the U.S., supplies excellent-quality high- and low-resolution-cartography data files. You can export files in black-and-white EPS format for inclusion in illustration and DTP programs. What's missing is cartography below the state level, such as county or city maps. However, this aside, Azimuth's standard projection mapping and excellent 2-D-CAD tools make it a valuable addition to any cartographer's Mac.

Graphsoft, Inc., 8370 Court Avenue, Suite 202, Ellicott City, MD 21043; (301) 461-9488. Version 2.0. \$395.

— Jeffrey A. Steinberg

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CIRCLE 160 ON READER SERVICE CARD.

NEW ON THE MENU
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Aqua Blooper Piper



If wrestling with the pipes under the kitchen sink is not your idea of a good time, you might be tempted to avoid a game that casts its players as plumbers. But in the case of Aqua Blooper Piper, you'd be missing a lot of fun. It comes from Casady & Greene, who also produced Crystal Quest. Like Crystal Quest, Aqua Blooper Piper has first-rate animation and sound and is guaranteed to be addictive.


The game's premise is that you have to get a customer's shower working by installing a water pipe between openings at the left and right sides of the screen. A conveyor belt moves pieces of pipe past you, and you install them by clicking and dragging them to any pipe opening. To complete a level successfully, you must create an unbroken pipe between the left and right connections. If you do — and that's a big if — you'll advance to a faster, more challenging level.

The pipe pieces run the gamut from straight ones equipped with openings at each end to Rube Goldberg-esque pieces with twists, turns, and multiple outlets. You have to work fast, because you're penalized for each piece that drops off the end of the conveyor belt. At higher levels, the game tortures you with frustrating time limits. You're still penalized for any pieces you drop and also for any leaks in the pipes. Positive reinforcement is fairly hard to come by; it consists of bonuses for creating perfect pipes, using lots of pipe pieces, and completing a level quickly.

For your convenience, there's a "boss key," which displays a fake bomb dialog box on-screen. Clicking on Resume takes you back to the game in progress, and clicking on Restart exits the game. This comes in handy for hopelessly addicted players who find themselves laying pipe on the sly while they're at work. Another nice touch is a customizer application, which lets you change sounds or pictures as well as import your own.

Like every good game, Aqua Blooper Piper is easy to learn and difficult to master. And it's a bit like eating salted peanuts — it's almost impossible to quit once you've gotten started.

Casady & Greene, Inc., 22734 Portola Drive, Salinas, CA 93908; (800) 359-4920 or (408) 484-9228. Version 1.1. \$49.95.

— Bob LeVitus 

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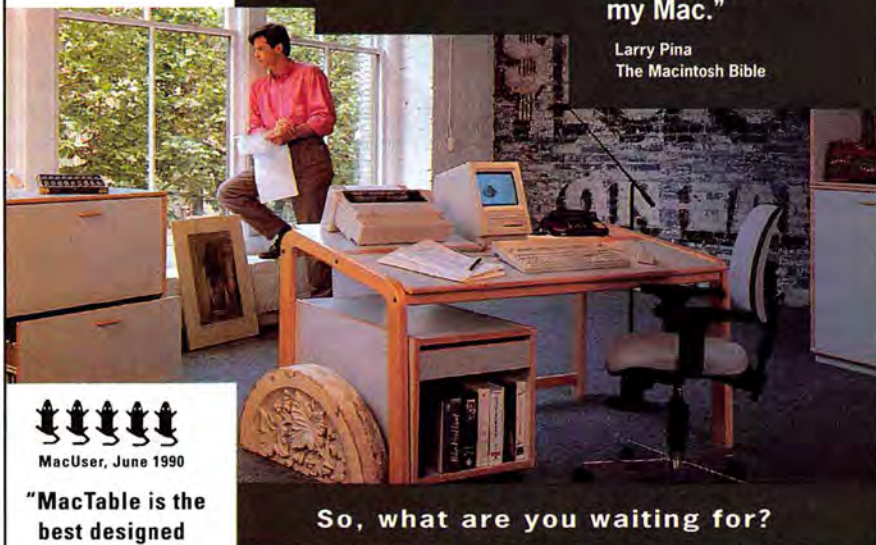
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MacUser, June 1990

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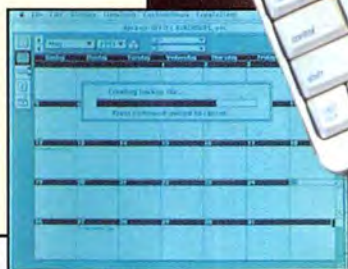
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6 reasons you should own a



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Powerful enough to be your only computer!

Our portable notebook computer weighs only 6.25 lbs. Yet it has so many features that it's capable of being your only computer. With 25 MHz of computing speed and a math coprocessor, it's faster than a Mac IIx; its specifications are comparable to a Mac IIci. The TRAVLER includes a standard SCSI port. It only takes a minute to connect it to your network or a computer to transfer data, or to use as a hard drive.

Don't judge a book by its cover!

	RealTech TRAVLER 880*	Apple PowerBook 170
Price	\$3495	\$4599
Pros	Motorola 68030E 25MHz 8 Mb RAM (upgradable to 14 Mb) 80 Mb hard drive Math coprocessor 1.44 Mb SuperDrive compatible SCSI port (connects to other computers via SCSI port for data transfer) Camcorder battery (3 hours) Backlit LCD display 640 x 480 resolution SCSI cable included** DayMaker software (\$99 value)	Motorola 68030 25MHz 4 Mb RAM (upgradable to 8 Mb) 40 Mb hard drive Math coprocessor 1.44 Mb SuperDrive SCSI port (needs special SCSI cable sold only by Apple) NiCad battery (3 hours) Backlit active matrix screen 640 x 400 resolution 2400 baud modem/9600 send fax
Cons		Very expensive Limited to 8 Mb RAM Costly accessories

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8 Mb RAM...and an 80 Mb hard drive!

The TRAVLER 880 has 8 Mb of RAM, upgradable to 14 Mb (nearly double the RAM in the Apple PowerBook 170)...enough memory to run almost any Macintosh program. (The TRAVLER 1480 has a whopping 14 Mb of RAM!) And with its high-speed, high-capacity 80 Mb hard drive, there's plenty of storage.

Can be connected to any Macintosh desktop computer.

Unlike the Apple PowerBook 170, the RealTech TRAVLER's SCSI port and cable (included free) make it easy to connect to any Macintosh computer with a SCSI port. Upon start-up, the TRAVLER's hard drive and floppy will appear directly on your Macintosh desktop, just like any other hard

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174-179)
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drive or floppy. You no longer need to maintain two versions of each file (one for the desktop Macintosh and one for your notebook), since all of your files will permanently reside in the TRAVLER. When you're ready to leave the office, just shut down the desktop Macintosh, disconnect the TRAVLER's SCSI cable, and you're on your way. No more disk swapping to maintain your files.

Takes the place of a Mac IIci. So you only need one computer, not two.

Now you only need one computer for office and travel, and only ONE set of datafiles!

The RealTech TRAVLER is so powerful it can double as your desktop computer. When you add an optional full-page display (\$879) or 21" dual-page display (\$1279), mouse, and keyboard, its specifications are comparable to a Mac IIci. So why would you buy one of those when you could own a RealTech TRAVLER you can take with you?

The RealTech TRAVLER is fully authorized by Apple Computer, Inc.

It's the best portable solution available. When has the decision to buy a computer ever been such an open and shut case?

All trademarks are the property of Apple Computer, Inc. and MBSI.

“My ad agency got really mad at me about this notebook computer.

Like me, they're very excited about the benefits — and price — of the RealTech TRAVLER. We'd spent a lot of time thinking about what you'd want in a notebook computer. And we invested a considerable amount of time and money figuring out how to improve what was already on the market.

To make a long story short, we achieved our goal. The RealTech TRAVLER is more powerful than the Apple PowerBook 170; it has more RAM, a bigger hard drive, and more standard features. All that, and it's priced over \$1000 lower.

So why is my ad agency mad? Because I wouldn't give up our prototype model to be photographed. (We only had one TRAVLER in hand when we began work on this ad.)

In less than a week, I became so attached to my TRAVLER that I wouldn't give it up, even for a day. I do a lot of traveling, and it quickly became indispensable to my productivity. I made the agency wait 'til TRAVLERS were rolling off the line, then sent the agency one to shoot for this ad.

Now I have another problem...I can't get the agency president to return it. After she used it for a day, she was hooked, too!”

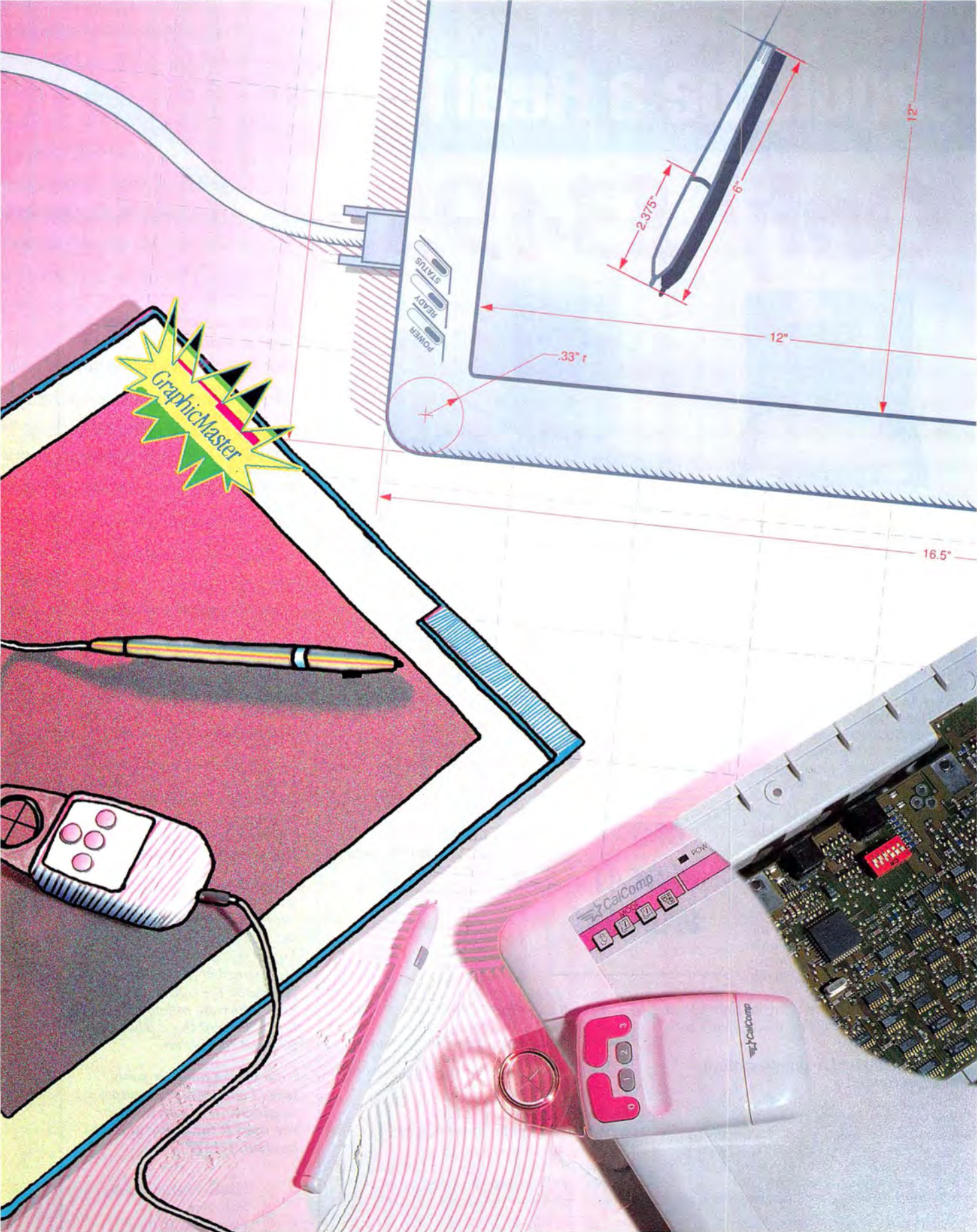
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Graphics Tablets: Drawing the Line

Whether you're drawing engineering blueprints or painting in the style of Monet, digitizing tablets are an easy-to-use, affordable way to record your strokes of genius.

●
**BY SALVATORE
PARASCANDOLO**

Painting on the Mac has been revolutionized in the past year by the introduction of "natural" painting applications such as Fractal Design's Painter and Time Arts' Oasis, which offer a wide variety of brushlike effects. Suddenly, Mac-painted art no longer has to look any different from that created with traditional media such as oils or pastels. This powerful new software, though, mandates a tool other than the Mac's standard mouse cursor-control device: the graphics tablet. Graphics tablets make electronic painting feel natural by letting you use a pen as your pointing tool.

Tablets for the Mac and other systems have been around for years. Although they started out as pricey professional tools for architects, drafters, and engineers, today's small-format models are less expensive, attracting users from all over the graphic-arts world who want to take advantage of the latest breakthroughs in painting software.

How It Works: Graphics Tablets



The diagram shows a perspective view of a light blue graphics tablet. A purple pen with a black band is shown touching the tablet's surface. A white, mouse-like puck is also shown on the tablet. The tablet has a grid of small squares on its surface. A black line is drawn on the tablet. A small blue circle with the number '1' is located near the bottom right corner of the tablet. A small blue circle with the number '2' is located near the top right corner of the tablet, next to the pen.

1 A typical digitizing tablet has a flat drawing surface that covers an electromagnetic sensing grid. Radio signals received by the grid can precisely read the position of a pointing device — which is typically a special pen or a mouselike puck — to within .0001 of an inch. All the tablets we looked at let you switch between a mouse, a pen, and a puck at any time.

For this article, we evaluated six Mac-compatible tablets — the CalComp DrawingBoard II, Kurta IS, Numonics GraphicMaster, Numonics GridMaster, Summagraphics SummaSketch II, and Wacom SD420E. We chose tablets that cost less than \$1,000 and that have a 12-x-12-inch active area. These are practical limits for most uses and most users. Tablets are actually available in a range of sizes from 6 x 9 inches to 48 x 60 inches and beyond, with prices increasing steeply with size.

A Few Pointers

The ability to use a pen, or stylus, is why many artists use tablets in the first place. You hold the pen, whose tip is essentially a mouse button, as you do an ordinary pen or brush. Pressing the pen onto the tablet has the same effect as clicking a mouse button. Most pens also have a side-mounted button where your index finger naturally falls. This button typically serves the same purpose as a second mouse button or, depending on the tablet system, can be assigned a special function such as a double-click or the activation of a macro.

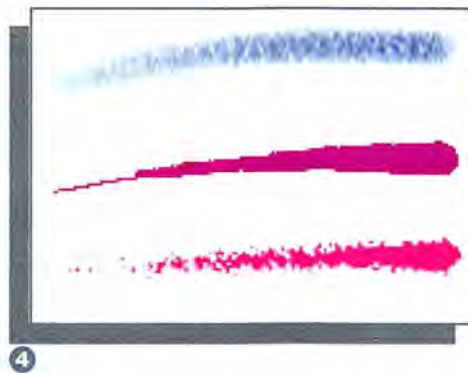
The most significant improvement in tablet technology — pressure sensitivity — takes electronic painting leaps and bounds closer to the real thing. Using an electronic pen for natural strokes is wonderful enough, but when the

painting tool also responds to finger pressure, it's a dream come true. Wacom introduced pressure-sensing pen-and-tablet systems to the Mac market, and artists and photo editors have adopted them in droves. By the time you read this, both CalComp and Kurta will be shipping their own pressure-sensitive tablets. CalComp and Wacom have opted to offer pressure sensitivity only in serial-port tablets; Kurta's pressure-sensitive tablet will come in serial and ADB versions.

Many tablets can also be used with a pointing device called a *puck*. Pucks generally look and handle like a mouse, but most are also equipped with four or more buttons, each of which can be assigned special time-saving functions. Pucks have a clear plastic area at the front with a cross hair whose exact location is sensed by the tablet. The cross hair makes it possible to place the puck very precisely over the points of a tablet-mounted graphic. Although any tablet's pen and puck should sense a given point identically, with most tablets we tested, a given point sensed by the pen was sensed by the puck as being anywhere from one pixel to 1/4 of an inch away.

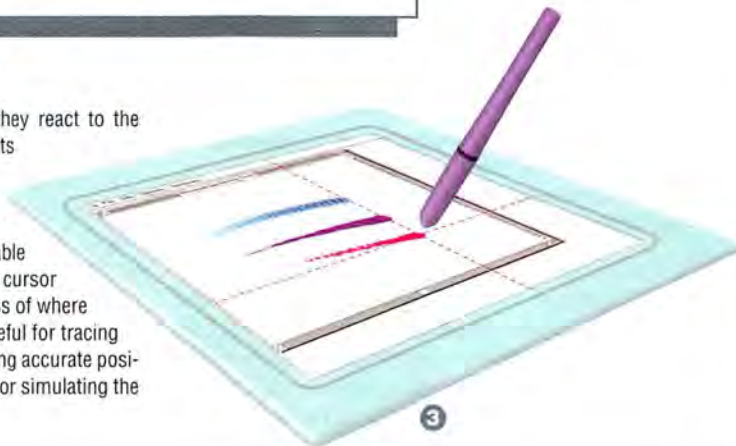
All the tablets we looked at can resolve 200 to 1,000 distinct points in an inch. The issue of resolution will concern you only if you need superaccurate measuring, for such uses as engineering or image analysis, and then only

2 Most tablet pens contain small batteries that transmit radio signals. An exception is the Wacom pen, which, instead of batteries, uses a passive circuit that reemits a signal received from the tablet.



4 In addition to sensing a pen stroke, some graphics tablets offer pressure sensitivity, which is the key to producing the most-natural results. By applying pressure with different software tools, you can control elements such as the density of a stroke (top), the thickness of a stroke (middle), or both density and thickness at the same time (bottom).

3 Part of what makes tablets special is how they react to the movements of the pointing device. Graphics tablets primarily use *absolute positioning*, which means that a point on the tablet always corresponds to the same point on the screen. Instead of rolling your mouse to an area, you place a movable pointer on a spot on the tablet and the on-screen cursor jumps to the related spot on the screen, regardless of where the cursor was before. Absolute positioning is useful for tracing drawings originally rendered on paper, for gathering accurate positional information from a conventional image, or for simulating the natural motion of an artist's paintbrush.



if you're using a puck. If you intend to use the pen and mainly paint or photo-edit, there's no point in paying for the ability to hand-trace bacteria.

For all practical purposes, the resolution of most tablets far exceeds human capability, especially if you use them with pens, which have relatively blunt tips. Moreover, if you hold the pen tip steady at a given point on the tablet and then tilt the pen, the tablet will erroneously sense that the pen tip has changed position. With the tablets we tested, tilting the pen through a 90-degree arc caused a tilt shift of $1/32$ to $1/16$ of an inch, with the Kurta tablet straying as much as $3/8$ of an inch. If you naturally hold a pen at a constant angle, tilt shift isn't a problem; if your drawing motion is looser, however, excessive tilt shift might noticeably distort the shape of your strokes.

Making Connections

A tablet communicates with a Mac in one of two ways: through a serial port (either the modem or the printer port) or through an ADB port (the keyboard/mouse port). Connecting a tablet to the ADB port is easy: You just plug it in to an ADB port at the back of the Mac or at the side of the keyboard. Machines with two ADB ports, such as the SE and the Mac II line, can easily accommodate both an ADB tablet and a mouse. Macs with a single ADB port, such as

the Classic and the LC, require you to disconnect the mouse to plug in the tablet — unless the tablet itself provides an additional ADB port, as do the CalComp, Kurta, and Summagraphics tablets.

Tablets that connect to a serial port offer several advantages over their ADB cousins: They have the potential for greater speed; they can work on any Mac from a 512Ke on up; and with the right cables and software, all the serial tablets we looked at can be used with a PC-compatible machine. The price for this flexibility is some extra time and effort in configuring the tablet to work with your serial port.

The majority of ADB tablets, such as the CalComp DrawingBoard II and the Numonics GraphicMaster, get their power from the ADB port, so one cable conveniently does it all. Other tablets need to plug in to standard 120- or 240-volt outlets.

CalComp DrawingBoard II

This tablet, among the least obtrusive in the class considered here, is a lightweight ADB unit with a plastic-overlay top. Its nicely rounded edges don't dig into your arm during long sessions, and its surface has a slight tilt, which you can increase with two flip-out legs. Button areas across the top let you pictorially choose the tablet's mode — absolute or relative — and several other options. You can assign

Input Devices

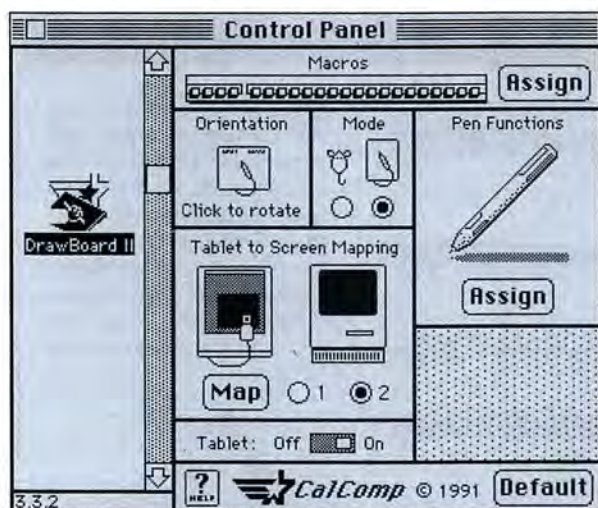


Figure 1: The CalComp DrawingBoard II's software is among the best. It offers excellent visual clues and sensible options — for instance, the picture of the pointing device changes as you place a different one on the tablet.

keyboard command equivalents to 18 numbered buttons.

The DrawingBoard II's customization control-panel software is superb. It's smart enough to recognize whether you're using a pen, a 4-button puck, or a 16-button puck, and when you place a different pointing device on the tablet, you see a picture of it on-screen along with the appropriate customization options.

The cordless pen and puck, powered by a special battery available from CalComp, are thoughtfully designed. Even though it's battery-powered, the pen feels like a pen, and the bottom of the puck is smooth plastic and glides over any surface. The accuracy of both the pen and the puck is excellent, and unique among the six tablets, we found that items we drew with the pen and the puck registered precisely.

The DrawingBoard II is part of CalComp's 3300 series. A serial version of this tablet that supports a pressure-sensitive pen should be available by the time you read this. The pressure-sensing pen also senses tilt and passes that information to applications. Tilt data can be used for special effects or to help correct cursor-positioning errors. A slide-switch pen acts as a pressure transmitter, based on how much you slide it, not how hard you press.

Kurta IS Series

Kurta, a longtime Mac-tablet maker, offers its IS-series tablet in ADB and serial versions — the IS/ADB and the IS/ONE, respectively. The two types look and feel physically identical except for their electrical and data connections and the labeling of tablet controls, and they each accept cordless and corded pens and pucks. The active area is covered with a thick transparent plastic layer under which you can slip thin items to be traced or a template with button areas that activate macros. The tablets accept commercially available

plastic-overlay templates with predefined, preprogrammed button areas customized for specific applications. Across the top of the IS tablets are 13 color-coded buttons that can trigger macros. Several dedicated buttons let you exercise frequent options, such as toggling from absolute to relative mode or changing the working area's size and position.

The corded pen is normal-sized, and its metal tip glides well over any surface and with minimal wear. Its side-mounted button can act as a second mouse button or as a handy double-click button. The four-button puck has a small, cramped cross-hair area. The Kurta cordless devices are powered by five button-type batteries, so the cordless pen has to be hefty, about the size of a thick felt-tip marker. The pen's grip area has a comfortable triangular cross section, but those five batteries make the pen noticeably top-heavy. We found that the corded and the cordless pens showed good accuracy and consistency while being held upright, but tilting the pens produced a shift in the perceived pen location of as much as $\frac{3}{8}$ of an inch.

Kurta's entry in the pressure-sensitive arena is the XGT series, which should be shipping by the time you read this. The series has a 12-x-12-inch unit that comes in ADB and serial versions. Like the other Kurta offerings, the tablet has a dedicated button area as well as the ability to run macros when you click on tablet-area buttons. The software includes an extension that enables the information from the Kurta XGT to mimic the data stream from a Wacom tablet, making it compatible with Wacom-aware applications.

The cordless pointers available for the XGT include a pressure-sensitive pen, a standard pen, and a puck — all new designs. The pens are lighter and smaller than the previous cordless model and take three tiny button batteries instead of five larger ones. The cordless four-button puck has a rounded-slope design that makes it easy to hold. The XGT tablet will cost \$545. Also available will be an interface kit (\$50), a cordless pressure pen (\$300), a cordless four-button puck (\$100), and a corded standard pen (\$100).

Numonics GraphicMaster

This exceptionally light ADB tablet has a slight tilt that you can increase by installing two legs, which are normally stored underneath. It's pleasingly portable and simple to set up. The pen has a side-mounted button that acts as a double-click button, a minor but significant feature that overcomes the tendency of most pens to shift their pointer position as you double-click with the tip. The system is responsive even to fast strokes. The puck has a velveteen bottom and handles comfortably. Both pointing devices performed well in our accuracy tests.

The no-frills software lets you set the active area of the tablet either numerically or graphically. There are no macro-activation options or buttons on the tablet itself. Although this tablet system is feature-lean, the GraphicMaster tablet is the lightest of the rigid tablets and it's as close to plug-and-play as tablets get.

Numonics GridMaster

Unlike the other tablets, the GridMaster is flexible — *really* flexible. It's a mere $\frac{1}{32}$ of an inch thick, and the only solid part is a small rectangular box on the upper right corner, where all the connections are made. Its thin profile allows you to tape it to your work surface and place workaday items or a layer of protective paper on top of it, completely hiding the unit, whether it's in use or not. If you're on the move, this tablet can easily move with you.

The GridMaster uses the same pointing devices as the GraphicMaster does, and its operational accuracy is generally equal to that of its more conventional cousin. The pen is slightly less accurate; you could probably improve accuracy by taping the tablet as flat as possible to the desktop. We thought the tablet felt odd at first, but it responded very well to every stroke and was a pleasure to use.

Summagraphics SummaSketch II

If you like cables, this is the tablet for you. It comes with a power supply that plugs in to a wall outlet and then in to a special cable that plugs in to the tablet. That cable plugs in to an ADB adapter box with twin ADB ports, one of which connects to your Mac. The pen and puck are both corded and add to your developing network.

Electronically, this tablet is top-notch, but two significant physical aspects make it hard to use: It has the coarsest surface of the bunch, and the pen requires substantial tip pressure to communicate a click. This combination makes for a grating experience, in both the aural and the tactile sense. In Photoshop the pen required substantial pressure to communicate a continuous stroke; if the pressure eased, the tablet mistakenly thought a stroke was finished. Luckily, the pen has a side-mounted button that can act as the click button, although it's still not compensation enough for the heavy-handed drag-and-click. The four-button puck is rectangular, narrow, and unergonomic.

The software for customizing the SummaSketch II options is straightforward but purely numerical. You can't show the software what you want by gesturing over the tablet; instead, you must set the location, size, and aspect ratio of the active area with four sliders. There is no automatic maintenance of horizontal and vertical proportions. Fortunately, the documentation is well-illustrated and clearly written.

Wacom SD420E

Wacom has been a provider of pressure-sensitive-tablet systems for a long time. The star of its show is the natural-feeling, cordless, batteryless pressure-sensing pen, which is simply constructed and maintenance-free. The slight disadvantage is that the maximum thickness of objects you can trace is about $\frac{3}{8}$ of an inch compared with about $\frac{1}{2}$ an inch for most other tablets. You can customize the system's response to pressure by setting the threshold value (from 3 to 63) beyond which the pressure on the stylus causes a

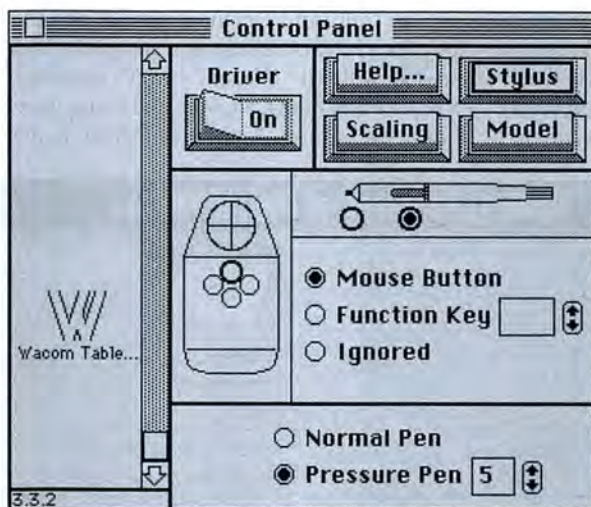


Figure 2: Wacom's pressure-sensing pen offers new capabilities and related options. The company's customization software lets you specify the minimum pressure that the tablet interprets as a click. You can also assign special functions to each of the four puck buttons.

reaction. Even without software for handling pressure sensitivity, this system lets you make a mouse-click with a feather touch. The cordless, batteryless four-button puck doesn't sense pressure. On the plus side, it has an exceptionally sharp cross-hair area; on the minus side, this puck drags more than those of the other tablets do. You can assign function-key equivalents to its four buttons.

Wacom supplies software plug-in tools for SuperPaint and UltraPaint and includes a stand-alone application called PressurePaint. Several applications, such as FreeHand, ColorStudio, Oasis, Painter, Photoshop, and Studio/32, offer pressure-sensitive tools that work with the Wacom driver.


The Bottom Line

By now you may be thinking that a digitizing tablet is a must-have peripheral. But if you don't frequently work with painting or photo-editing applications, your tablet may end up serving primarily as a large and expensive mouse pad. Once you adopt a tablet, it can demand a sizable chunk of your work space. The footprint of a typical 12-x-12-inch tablet is closer to 16 x 16 inches — roughly equivalent to that of a Mac IIx CPU. If you frequently need to trace small-format art, a tablet is not the way to go; instead, you should scan your work and then auto-trace it with a dedicated tracing application.

If you decide that you do need a tablet, consider your main applications and whether you'll be using a pen or a puck the most. Generally, a puck is best for technical applications such as drawing, analyzing, and measuring and a pen excels wherever paintings or photos are involved. For pure pointing pleasure and hassle-free performance,







Input Devices

our top picks are the CalComp DrawingBoard II and the Wacom SD420E. They have excellent pens and pucks, and we were impressed with the Wacom tablet's pressure sensitivity — a feature that both CalComp and Kurta were planning to offer at press time. A close runner-up is the

lightweight Numonics GraphicMaster, which is extremely easy to set up and use. 

Graphics guru Salvatore Parascandolo suggests that if painting with a mouse gives you headaches, use one or two tablets and call him in the morning.

Table 1: Features of Digital Tablets

	 CalComp DrawingBoard II ★★★★	 Kurta IS ★★★★½	 Numonics GraphicMaster ★★★★
List price*	with corded pen/puck, \$495; with cordless pen/puck, \$645	IS/ADB, \$595; IS/ONE, \$645	\$595
Pros	Excellent software. Natural-feeling pen. Well-designed puck.	Extensive setup options. Excellent macro power. Macro templates available. Works with PCs and Macs (serial version only).	Light and portable. Easy setup.
Cons		Heavy cordless pen. High pen-tilt position error. Complex documentation.	No cordless pointing devices available.
Company	CalComp, Inc. 14555 N. 82nd St. Scottsdale, AZ 85260 (602) 948-6540	Kurta Corp. P.O. Box 60250 Phoenix, AZ 85082 (602) 276-5533	Numonics Corp. 101 Commerce Dr. Montgomeryville, PA 18936 (215) 362-2766
	 Numonics GridMaster ★★★★½	 Summagraphics SummaSketch II ★★★★	 Wacom SD420E ★★★★★
List price*	with pen, \$449; with puck, \$469	\$699	\$995
Pros	Thin, light, and portable. Easy to set up. Can be taped to desk. Can be used with any Mac.	Works with PCs and Macs.	Works with PCs and Macs. Excellent software. No batteries. Can be used with any Mac.
Cons	Subject to kinks and puncture damage. No cordless pointing devices available.	Rough surface. Pen needs a heavy hand. No cordless pointing devices available. Lots of cables.	Maximum traceable thickness of objects is less than with other tablets.
Company	Numonics Corp. 101 Commerce Dr. Montgomeryville, PA 18936 (215) 362-2766	Summagraphics Corp. 60 Silvermine Rd Seymour, CT 06483 (203) 881-5400	Wacom Technology Corp. 501 S.E. Columbia Shores Blvd., Ste. 300 Vancouver, WA 98661 (201) 265-4226

*The price is for the 12-x-12-inch size; all tablets are available in other sizes.

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Paddle not inc

You would not be considered
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©1992 Radius Inc. Radius, the Radius logo and all Radius product names are trademarks of Radius Inc. Other brand and product names are trademarks of their respective holders. For your local Radius International dealer call 408-434-1010. *Compatibility with the Macintosh II, IIx, IIcx and IIfx. **Tested under System 6 Finder with RAM cache off. Tests performed in black and white on 12- or 13-inch monitors, with AppleTalk off, minimum disk cache and extensions turned off. MacWeek 10/22/91.

W E M A K E O R D I N A R Y C O M P U T E R S

and cell luded.

board will instantly turn your
Mac II* into one bad apple.



The Rocket easily plugs into your NuBus slot and protects your current investment by utilizing your Mac, not replacing it. Our unique architecture supports up to 128 MB of RAM and enables your existing motherboard to handle I/O commands while the Rocket's 040 races up to 6 times faster than your Mac II.

Recent tests conducted by MacWEEK showed the Rocket beating the pants off other 040 based alternatives in graphics performance. Speed of response. Requests for processing time. And integer-math tests (see performance chart below).

And when you consider the Rocket's compatibility features like the ability to simulate the 030's cache mode or the ability to run either System 6 or System 7, you have to really wonder

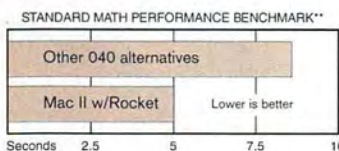
why it's practical to choose any alternative to the Rocket 25i.

If you're not sure your system is ready for the power and the speed of a Rocket just give us a call and we'll send you a free Rocket Lift-Off disk to slip into your Mac. The disk will detail compatibility with your computer's system software, motherboard, peripherals and network.

So, if you're interested in an incredibly easy up-grade with the \$1499 Rocket 25i. Or the \$1999 Rocket with the integrated math coprocessor, simply call us at 1-800-227-2795. Or call 1-800-966-7360 and we'll fax you everything you need to know about either of these accelerator



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Sizable Storage: 200-Megabyte Hard Drives

Is data inflation filling your hard disk?

*MacUser Labs looks under the hood of 41 jumbo hard drives
and picks 6 that make the grade.*

BY WINN L. ROSCH AND THE MACUSER LABS STAFF



Every generation of software adds another twist to the data-inflation spiral. Take Photoshop, for example. One of its full-page, full-color images can consume 20 megabytes, but when you consider the working and undo copies of each image, at another 20 megabytes apiece, you can see why your Mac's internal 40-megabyte drive offers no more of a hedge against inflation than does an investment in rubles. Instead, today's smart money is on a storage format that offers an optimal compromise between future storage needs and your budget: 200-megabyte drives. Although even-larger hard drives can offer a lower per-megabyte cost, the prices of 200-megabyte hard drives (they start at \$659) enable the cost-conscious to fight data inflation without blowing their budgets.

Not All Mechanisms Are Alike

For this review of 200-megabyte drives, we examined 41 drives from 29 vendors (many vendors offer more than one version of their drive, with differing mechanisms). Currently, all the drives in this category are based on one of six mechanisms: the Conner CP-3200F, Fujitsu M2614SA, Hewlett-Packard C2233, Maxtor LXT-213SY, Plus Impulse 210S, or Quantum ProDrive 210S — the Plus mechanism is actually the ProDrive 210S, relabeled by Plus Development, a former subsidiary of Quantum.

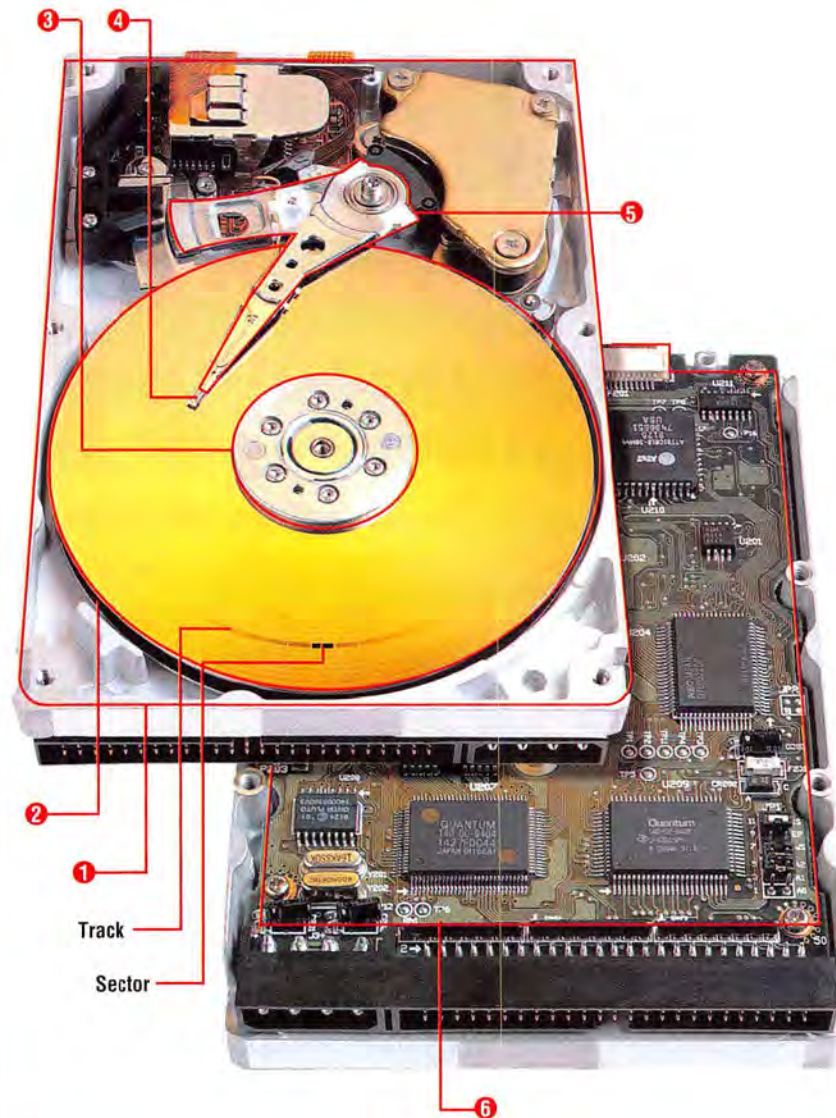
Choosing a drive is more complicated than picking the one with the fastest mechanism or the lowest price. For one thing, the slowest mechanism isn't much less expensive than the fastest: The Saturae Proline, which is based on the Hewlett-Packard mechanism, is almost twice as fast as the Relax Vista 180, which is based on the Fujitsu mechanism, yet it costs only \$140 more. And depending on which Mac you connect the drive to, opting for one with the fastest mechanism might be a waste of money. Slower Macs, such as the 68000-based Classic, can't take full advantage of the fastest disk-access speeds, because of CPU clock-speed and SCSI-interface bottlenecks; for these less powerful Macs, a slower and less expensive drive can be perfectly adequate.

In addition to providing the mechanism inside the case, vendors offer different levels of support, construction quality, warranty length, and service. Depending on your resources, you may choose your new drive based on these considerations. If you don't have an in-house technical-support department that can install, troubleshoot, and maintain your drive, for example, you may want to buy from a local computer dealer or vendor that provides some hand-holding or a long-term warranty.

The Hard-Drive Score Card

Whether you're talking dollars or data, inflation is a real-world problem, so we took a real-world approach to our testing. Starting with the shipping

How It Works: Storing, Finding, and Moving Your Data



box at our doorstep, we evaluated everything from the packaging to the drive's construction and performance. Each drive earned scores in three broad categories — service and packaging, performance, and design and construction — and each drive's score in these categories was plotted along with its price, in dollars per megabyte (see Figures 1, 2, and 3, respectively). The price per megabyte ranges from

that of the MacTown DataStor 210 MB, at \$3.34 per megabyte, to that of the Liberty 70210Q, at \$7.09 per megabyte.

Choose your drive from whichever of these categories is most important to you. The closer to the top of the chart, the less expensive the drive, and the farther right, the higher score that drive received in that category, so drives closest to the upper right corner of

The head-disk assembly ❶ contains the platters, or disks ❷ that store the data in concentric circles, known as tracks. The spindle motor ❸ rotates the platters at a precise speed while read/write heads ❹ read data from and write data to the platters. An actuator ❺ moves the heads from track to track. The SCSI controller ❻ coordinates all these mechanical parts.

Throughput — how much data actually gets written or read in a given period of time — is determined by a combination of the spindle-motor speed, the number of sectors per track, and the sector size. For example, Quantum's new ProDrive 240S (illustrated here) combines a 4,306-revolution-per-minute rotational speed, a maximum of 87 sectors on the outside tracks, and a 512-byte sector size to produce a sustained data-transfer rate of about 3 megabytes per second; actual performance is about 10 percent faster than that of the ProDrive 210S, used by many of the drives evaluated for this report.

Other factors involving the simple mechanics of finding the data on the platter also affect hard-drive speed. The ProDrive 240S has four read/write heads — one for each side of its two platters. The time it takes to switch between heads — the *head-switch time* — is about 2 milliseconds. Add to this some amount of *latency* — the time it takes for the correct sector to come under the head — and *seek time* — the time it takes the actuator to position the heads over the right track — and you have the access time. Because the Mac reads and writes in small chunks and has to prepare these chunks of data before sending them to the disk or process them after they've been read, each read or write transaction has a small amount of processing time tagged on to the access time.

— Jeff Pittelkau

each chart offer the best performance per price in that category. If you're a relative novice when it comes to hardware — you simply want the most-comprehensible instructions — or if you are concerned about wasteful packaging, choose a drive from among the top of the packaging-and-service scores. If you don't care about packaging and simply want the fastest drive available, look at the performance

chart. Or if you want a drive that's designed for ease of use and is built to last, pick from among those drives with higher design-and-construction scores.

Ecopackaging Is Rare

We opened each box, first evaluating the packing material: Was it dangerously spartan, was it ecologically conservative yet utilitarian, or were half the trees in the Pacific Northwest used to protect the drive? No drive suffered shipping damage because of skimpy packaging; on the other hand, some packaging was so wasteful that the vendors should have filed environmental-impact statements. The Microtech Nova N200, the Relax Vista 180 and 210, and the Tulin Hive Jr 210 MB, for example, were wallowing in enough polluting pink-plastic popcorn to supply a double feature of the *Toxic Avenger*. The Relax drives' cables and terminators were also wrapped in plastic bags, which had in turn been stuffed into individual boxes inside the shipping carton. On the other hand, the packaging of the APS Maxtor 213 ZFP, the APS Quantum 210 Portable, and the APS Quantum 210 ZFP was both functional and environmentally conservative.

After evaluating the packaging materials, we scrutinized the packing slip and the contents of the box. Most packages come with everything you need to set up the drive and get it running — a power cable, a SCSI cable, a SCSI terminator, and formatting software — but there are a few exceptions. The CD Technology HD Porta-Drive 200 didn't come with a SCSI cable; when prodded, the company promised to start including SCSI cables in the future. The Liberty 70210Q arrived with a photocopy of the formatting-software manual but no formatting software. And the MacProducts Magic 210 arrived without bolts in the case — oops. The last two problems were cleared up after a few quick phone calls, but we'd like vendors to take more care when shipping their merchandise.

Contented with the Contents

With everything at hand, we next took a closer look at the quality of the contents, giving points for service, documentation, and formatting and setup software. We judged service based on factors such as phone support (toll-free hot line preferred), availability of local dealers or service centers, data-recovery services, guaranteed turnaround time for repairs, warranty, and money-back guarantee. Just as you would when purchasing a drive, we evaluated service and warranty solely on the information supplied in the vendor's box.

Length of warranty is a leading indicator of quality: How much faith does the manufacturer have in its drive mechanism? Fujitsu and Hewlett-Packard both back their mechanisms with five-year warranties. (The Relax Vista 180 uses a Fujitsu mechanism; the Core Optima 200, Dynatek HDA 234, and Saturac Proline use the Hewlett-Packard mechanism.) All the other mechanisms have a two-year warranty.

In addition to the warranty supplied by the mechanism's manufacturer, a warranty for the rest of the package — the power supply and other components — is supplied by the drive vendor. Core and Microtech both offer five-year warranties, and Relax offers a three-year warranty for the Vista 180. CD Technology, CMS, Cutting Edge, HDI, Liberty, MacTown, MicroNet, Optima, PLI, and Procom all offer one-year warranties. All the other vendors offer two-year warranties, with the exception of Tulin, which includes no warranty information with its drive. Long warranties are a great thing, but they don't come without cost — generally, the longer the warranty, the more expensive the drive. See Table 1 for details of each vendor's warranty.

Most drives come with manuals for both hardware and software. Hardware manuals address such matters as terminating the SCSI chain and setting the SCSI ID; software manuals tell you how to use the formatting

software. Of the two, we found that the software manuals were generally more detailed. One example of an outstanding handbook is FWB's manual for Hard Disk ToolKit, the formatting-and-hard-drive-utility software bundled with the FWB PocketHammer 200. The accompanying 300-page manual does an excellent job of covering all aspects of SCSI technology and hard-drive installation as well as providing detailed instructions for each of Hard Disk ToolKit's modules. Relax Technology's documentation follows closely behind FWB's. Its manual is well illustrated and offers thorough coverage of setup issues, from hardware installation to SCSI termination and other technical matters.

In contrast to Relax's documentation, Tulin's manual for the Tulin Hive Jr 210 MB was a skimpy five-page affair, completely devoid of illustration. The hardware manual for HDI's PowerDrives was so poorly bound that many of its pages were cut off and hence unreadable, and HDI's software manual consisted solely of a ReadMe file.

Fine Formatting

The final step before we could come up with a packaging-and-service score was to evaluate the software. Although all the drives are already *formatted* (prepared so that the drive surface can store data) as shipped, you may want to use the formatting software to fine-tune the drive's settings to match its performance to that of your Mac. Many of the drives also ship with shareware, such as fonts, utilities, games, and HyperCard stacks. If you plan to reformat your drive, be sure to back up those shareware programs you want to keep.

Overall, we found that all the formatters worked adequately. The only appreciable difference among them was that the formatters included with the Deltaic Server 200Q and the Relax Vista 180 and 210 did not allow *partitioning*, which creates logical boundaries on your hard disk so that you can create separate volumes (which look

Cache Flow

You hear a lot about cache these days — but not the kind that pays your bills. A hard-drive cache is a group of chips that temporarily stores data to be written to, or just read from, the drive. Getting data from the cache is faster than getting it from the disk, because the data is stored in silicon RAM and no mechanical devices are required to search for it.

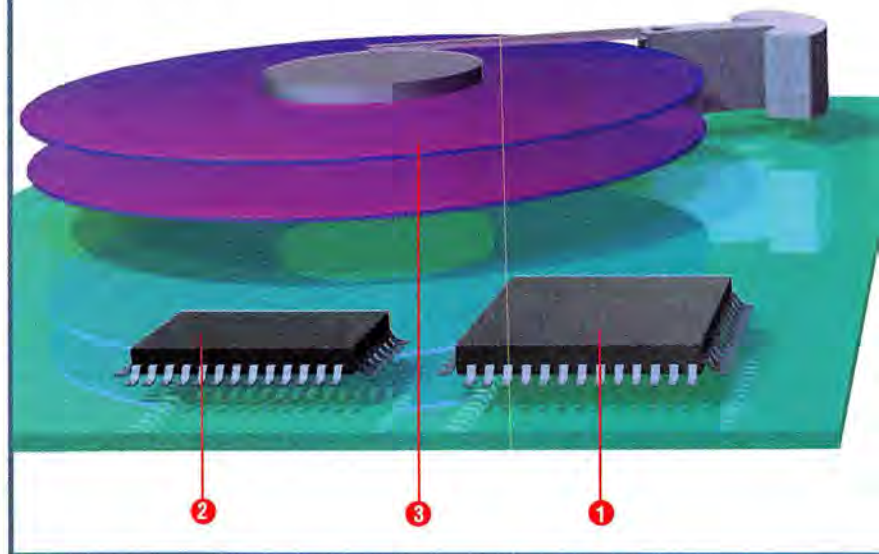
The amount of space devoted to a cache is usually small — 64K is standard — although larger cache sizes are becoming more common. A cache is typically built in to a hard-disk drive's *controller* ❶, the chip set that controls the disk mechanism. A hard-drive controller can have a *read cache*, a *write cache*, or both.

The read cache is the more common of the two. Data read from the drive is stored, en route to the Mac, in the controller's cache ❷. If the data is still in the cache the next time the Mac requests it, the data will be

read from the cache — this read is called a *cache hit* — instead of from the disk ❸, thus improving overall response. When space is needed for new data, the least recently used data is overwritten.

A read cache also *prefetches* data; rather than getting just the blocks requested, it also stores the next few blocks of data in anticipation of future requests. One big advantage of this scheme is that subsequent data requests from the Mac may well be for the data that is already stored in the cache; that data will be accessed many times faster than if the hard-drive mechanism is required to access it from the disk.

A write cache is similar to a read cache, except that it temporarily stores data that is to be written to the disk. As soon as the data is in the cache, the drive tells the Mac that it has already written the data. The Mac can then prepare the next chunk of data to be written while the drive actually writes the



like separate hard drives on your desktop) from a single disk. Partitioning your disk into more than one volume enables you to do such things as share one volume on your network while keeping the rest of your hard disk under wraps. If you want to divvy up your 200 megabytes into more than one volume, you'll need one of the formatters that lets you do so.

Of all the software we examined,

FWB's Hard Disk ToolKit was the most powerful. Hard Disk ToolKit's World Control module lets users alter a drive's *mode-page* settings — controls that can improve performance, capacity, and data security. Don't let Hard Disk ToolKit fall into unskilled hands, though. Allowing users to manipulate many of the drive's core functions opens the door to a host of problems, possibly including such serious

cached data to the disk. This overlapping of tasks dramatically increases write speeds.

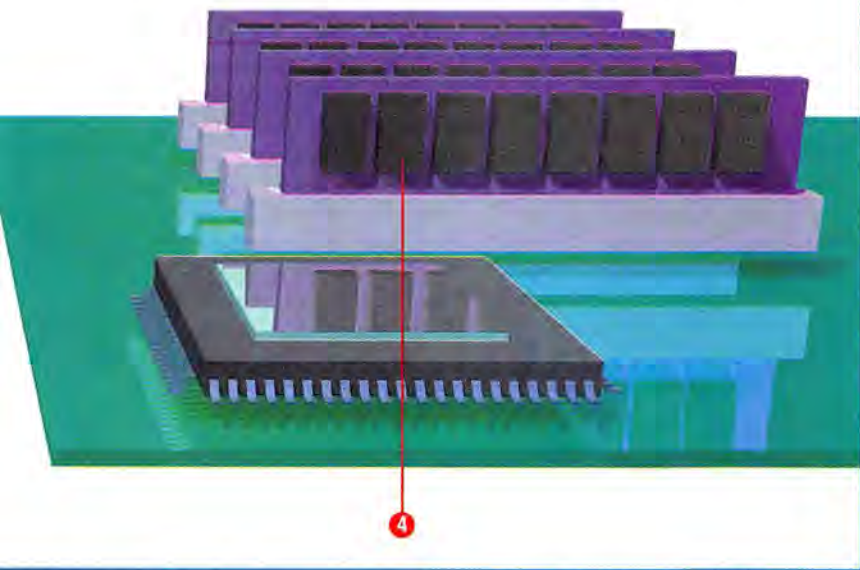
Some people argue that a write cache exposes users to a greater danger of data loss in the event that the drive suffers a power failure while data is in the write cache. In our tests of the Mac's power supply (see "When Lightning Strikes: Power Protection," February '92, page 190), we found that it can survive power outages lasting as long as 250 milliseconds without even flinching — a write cache usually stores data for only 2 milliseconds at a time.

The Mac's operating system has always allowed you to devote some of your Mac's RAM (4) to the task of disk caching. Under System 6, you could turn the cache on or off and adjust its size — in kilobytes — through the General control panel. Under System 7, the cache, which has been renamed the Disk Cache, is in the Memory control panel. The Disk Cache is similar to a hard-disk

drive's read cache, except that it does not perform any prefetching.

When accessing data, the Mac first searches the built-in Disk Cache; then the drive checks its read cache; and, finally, the drive checks the disk itself. You can no longer turn the Disk Cache off, but you can adjust its size; Apple recommends allocating 32K of cache for every megabyte of RAM. So, for example, an 8-megabyte Mac should have a 256K cache. Too large a cache can actually slow you down — the larger the cache, the more data the Mac must search through before finding what it's looking for. Because some applications take better advantage of the Disk Cache than others do, we recommend that you experiment with different values to see which size is optimal for your system. Remember to restart your Mac after fiddling with the cache size.

— Stephan Somogyi



damage to your drive that it has to be reformatted or even returned to the factory for repair.

Real-World Performance

We chose real-world applications to gauge certain aspects of a drive's performance. To test seek and access capabilities, we sorted a 2,000-record 4th Dimension database; to evaluate throughput, we copied a 13-megabyte

file by using DiskTop and duplicated another 13-megabyte file by using the Finder. Finally, to exercise all aspects of drive operation, we opened a 6-megabyte Photoshop file, rotated the image, and then saved it to disk. Because of the way it manages disk space for virtual memory, Photoshop gives hard drives a real workout. We scored the drive's performance based on these real-world tests and again plotted these

results along with the cost of each drive (see Figure 2). The Core Optima 200 and the Saturae Proline, both based on the Hewlett-Packard mechanism, were the fastest drives; the Relax Vista 180, which is based on a Fujitsu mechanism, was the slowest.

According to the mechanism manufacturers' specifications of average seek times — often considered a good means of determining drive speed — the drives that use the Hewlett-Packard C2233 mechanism, with an average seek time of 12.6 milliseconds, should be the fastest, followed by those that use the Maxtor LXT-213SY, Plus Impulse 210S, and Quantum ProDrive 210S mechanisms, at 15 milliseconds; those using the Conner CP-3200F, at 16 milliseconds; and, finally, those with the Fujitsu M2614SA, at 25 milliseconds. We found that other factors also affected overall speed, though, and that seek time — although an important indicator — doesn't tell the whole story.

Using *caches*, chips on the mechanism's controller that temporarily store data read from or to be written to the disk (see the "CacheFlow" sidebar), is one way to improve a drive's performance. To a degree, the larger the capacity of the cache, the greater the chance that it can conduct any given data transaction and thus eliminate access time. If a cache is too large, however, more time will be required for searching the cache to find data than would be necessary for accessing the same data on the disk. Most new mechanisms have caches of around 256K. The Hewlett-Packard C2233, the Quantum ProDrive 210S, and the Conner CP-3200F have 64K caches, the Maxtor LXT-213SY has a 32K cache, and the Fujitsu M2614SA offers a 24K cache. Our results affirm the importance of caches to some degree, but many drives overlap in terms of performance, because some vendors' driver software is more efficient than others'.

Also, a disk may have bad blocks, which have no effect on the drive's normal operation except that the drive

On the Horizon

You don't need a crystal ball to predict that future hard drives will store more data — and find that data faster — than do drives available today. Although drive capacities are increasing, drive sizes are shrinking from the classic 5.25-inch and 3.5-inch sizes to 2.5 inches — and smaller.

In jamming more data onto a smaller-sized platter, manufacturers are faced with the challenge of optimizing the head-to-disk interface. The closer the heads are to the disk, the more data can be stored on the platter. And therein lies the rub: Platter surfaces must be smooth enough to allow the heads to get as close as possible.

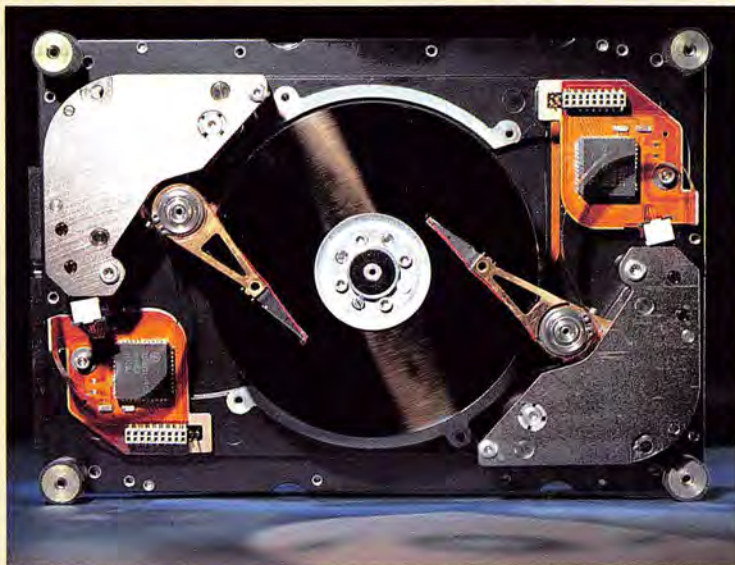
Aluminum is the most common disk *substrate*, the material from which the platters are made. At a microscopic level, however, aluminum platters are about as smooth as the Rockies. But by using smooth glass — either glasslike ceramic material or real silicon-based glass — as a substrate instead of aluminum, manufacturers can let the read/write heads float closer to the disk platters and achieve even greater storage densities. Areal Technology now offers glass platters in its drives, and other vendors will undoubtedly follow suit.

To achieve even greater densities, however, the read/write heads will have to come into direct contact with the disk's surface. Unfortunately, such direct contact either grinds tracks into the disk or wears out the

heads. However, friction-reducing liquid on the disk surface reduces wear while allowing the heads to approach actual contact; in effect, the heads no longer fly around the platter but swim. Manufacturers such as Seagate Technology are experimenting with this innovation and expect to produce commercial direct-contact disks in the next couple of years.

Increased access speed is another elusive goal in disk design. Manufacturers strive to trim the average seek times of their drives but are constrained by the laws of inertia. Over the years, drive makers have trimmed the size and mass of their actuators, and at this point, the law of diminishing returns has come into play — further reductions promise only modest improvements in speed.

Conner Peripherals, however, is developing a unique hard drive that breaks through the inertia limits and can dramatically reduce the average access time. To speed up access, Conner adds a second head stack with its own actuator. Earlier twin-actuator drives limited the travel of each actuator to only a part of the disk's surface, but in the Conner design — because the head stacks are located on opposite sides of the disk — each head stack can scan the entire disk. Thus, while one actuator is reading from or writing to the disk, the second actuator can be seeking the next requested data.



Two head stacks are better than one: Conner Peripheral's new drive with dual head stacks promises to dramatically reduce access time.

may take a little time to find blocks to replace defective ones. Most of the drives we tested had fewer than 5 of these type of factory defects, but the MicroNet MS200, the MacProducts Magic 210, and the Cutting Edge 207 MB had the most factory disk defects, with 41, 40, and 35, respectively.

One final performance-related issue for these hard drives is the news that two of the mechanisms examined in this report are being replaced by larger, faster versions. The Fujitsu M2614SA is being succeeded by the Fujitsu M2622SA, and the Quantum ProDrive 210S is being replaced by the Quantum ProDrive 240S. The new Fujitsu mechanism has a capacity of 330 megabytes instead of its predecessor's 180 megabytes. It also offers a 240K cache, a tenfold increase over its predecessor. It completed our suite of real-world tests in an impressive 4 minutes, 14 seconds; the earlier Fujitsu mechanism took 7 minutes, 47 seconds to complete the same tests. The ProDrive 240S has a capacity of 240 megabytes, has four times the cache size of its predecessor, and finished our real-world tests in an equally impressive 4 minutes, 10 seconds. The ProDrive 210S-based drives we tested for this report took anywhere from the 4 minutes, 48 seconds of the Relax Vista 210 and the Saurae Academy to the 5 minutes, 44 seconds of the MacProducts Magic 210.

Bear in mind that although the new mechanisms will result in drives with higher capacities and greater speed than their predecessors, drives based on the older mechanisms may become real bargains. Regardless of which drive you buy, make sure that the mechanism you expect to receive is the one the vendor is actually shipping in the product.

Built to Last?

Maybe you don't care about small-percentage differences in speed as much as you do about how well built the drive is or how much space it'll take up. We evaluated design details such as SCSI-ID-switch location and

Figure 1: Price Versus Service and Packaging

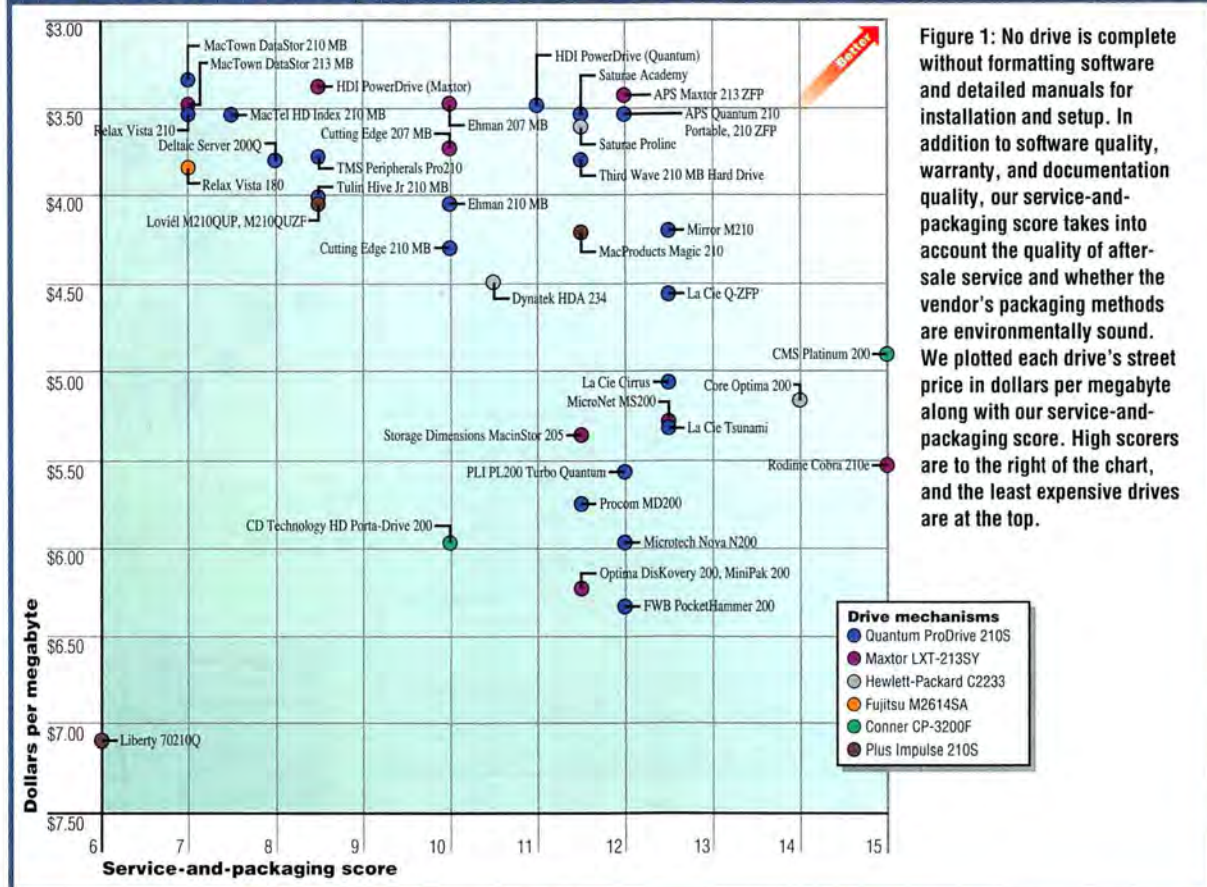


Figure 1: No drive is complete without formatting software and detailed manuals for installation and setup. In addition to software quality, warranty, and documentation quality, our service-and-packaging score takes into account the quality of after-sale service and whether the vendor's packaging methods are environmentally sound. We plotted each drive's street price in dollars per megabyte along with our service-and-packaging score. High scorers are to the right of the chart, and the least expensive drives are at the top.

type, power-switch positioning, AC-outlet availability, and how easy it is to adapt the drive to horizontal or vertical orientation. And we rated construction factors such as case quality, power-supply shielding, wiring quality, electrical fusing, length and shielding of the SCSI cable, and termination method. The more convenient and usable a product and the better its construction, the higher the score (see Figure 3).

Although most of the drives are tucked inside zero-footprint cases — the kind that fit under a Mac Classic — eight are small enough to claim some degree of briefcase portability. The Liberty 70210Q and the APS Quantum 210 Portable are the smallest. (The Optima MiniPak 200 is as small as these two, but its external power supply is as big as the drive itself.) Slightly larger than the Liberty 70210Q and

APS Quantum 210 Portable are the Core Optima 200, CD Technology HD Porta-Drive 200, La Cie Cirrus and Tsunami, and Tulin Hive Jr 210 MB. Extra points go to the Optima Diskovery 200, which offers sturdy removable feet for vertical orientation.

Cable quality may seem like a small detail, but a cable can make or break — literally — the connection between your Mac and the drive. Cable length is important; if you're daisy-chaining several drives, long cables can be a problem, because SCSI specifications limit the length of the entire daisy chain to 18 feet — unless you use a SCSI Plus extender (from Applied Concepts, of San Diego, California), which allows you to increase the length of your SCSI chain to 50 feet.

Normally, though, good cables are 3 feet long or less and are wrapped in

both a metal braid and foil to shield them from electrical noise. Better still are cables whose data wires are paired to and twisted together with a ground wire, thereby reducing signal degradation and electrical interference.

SCSI cables should have a 25-pin connector for the Mac at one end and whatever connector type is appropriate for the drive — 50-pin or 25-pin — at the other end. For the drive itself, we prefer playing SCSI by the book — 50-pin properly grounded connectors rather than the 25-pin connectors of the Mac. A 25-pin connector should be used only for drives that are so small that 50-pin connectors don't fit. To its credit, APS manages to fit two 50-pin SCSI connectors on its Quantum 210 Portable, which is about the same size as the Liberty 70210Q, whereas the Liberty drive settles for 25-pin SCSI

Figure 2: Price Versus Performance

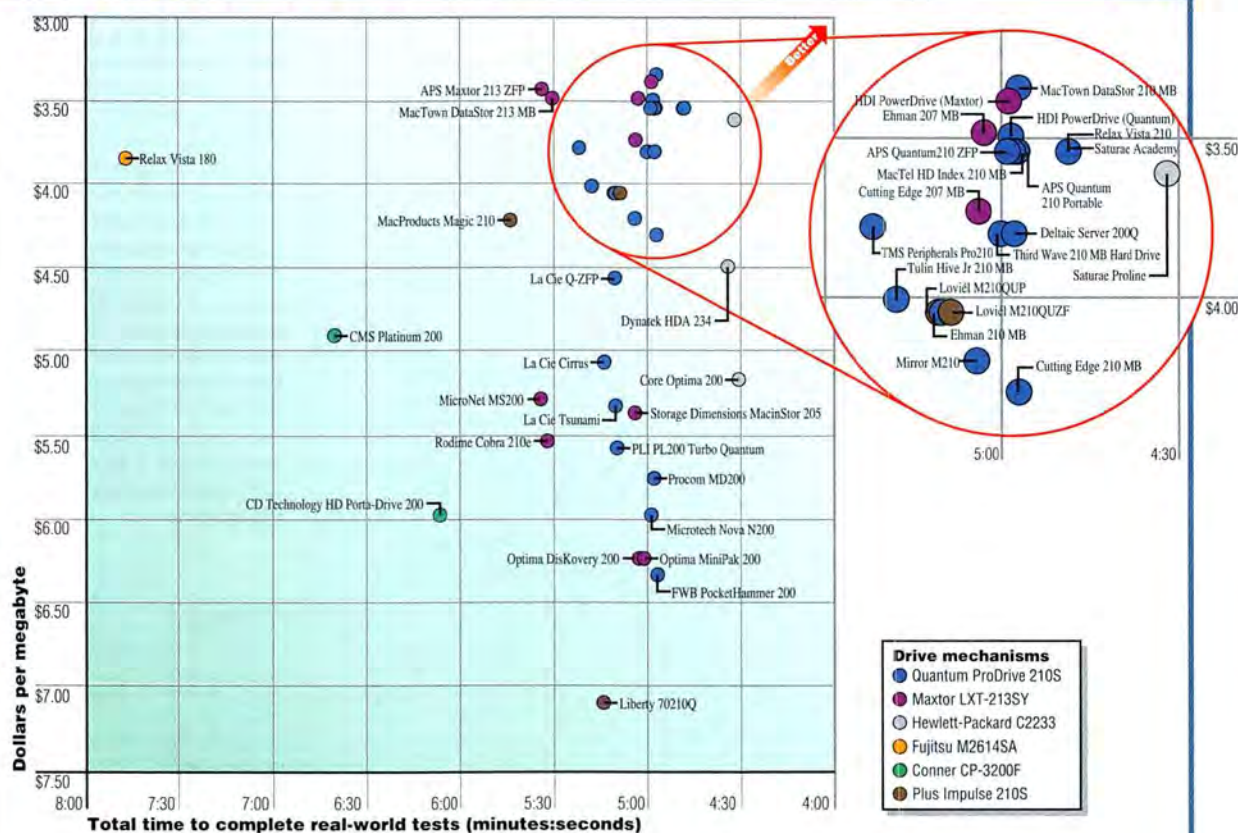


Figure 2: This plot shows which drives are the real speed-burners. We plotted each drive's street price in dollars per megabyte along with the total time it took to complete a suite of real-world tests that included file transfers, database sorts, and Photoshop file manipulation. The closer to the top of the chart, the less expensive the drive is per megabyte; the farther to the right, the faster the drive. Our real-world tests verified Hewlett-Packard's claim that it makes the fastest mechanism: The Core Optima 200, Satarae Proline, and Dynatek HDA 234 were the fastest drives, with virtually identical speeds. The faster drives based on the Quantum mechanism were so close behind them that, depending on which driver software was used or which application was tested, they almost matched some of the times of the drives based on the Hewlett-Packard mechanism.

connectors. The small La Cie Cirrus as well as the full-sized La Cie Q-ZFP have 25-pin connectors. Using 25-pin devices in SCSI chains that contain several devices can create signal problems, which is why many peripheral manufacturers recommend against mixing 25-pin and 50-pin devices in the same SCSI chain.

A Better ID

Every SCSI drive in a chain of connected devices must have a unique SCSI-ID number from 0 to 6; 0 is used

by external drives only when the Mac has no internal hard-disk drive, and the Mac is always 7. SCSI-ID selectors that limit the choice to valid numbers — 0 to 6 — prevent installation foul-ups and earned an extra point in our evaluation.

The best place for a SCSI-ID selector or indicator is on a drive's front panel, where you can easily see the ID number when you're setting up your drive. Unfortunately, the only company we know of that offers SCSI-ID selection and an indicator on the front panel of

its high-end drives is GCC Technologies — and it doesn't make a 200-megabyte drive. The worst place for the SCSI-ID selector is on the back of the drive next to the power switch, where you can inadvertently change the SCSI-ID number each time you turn the drive on. Core, Loviél, and Storage Dimensions all have the SCSI-ID selector in this precarious location.

The best (and most goof-proof) design for a SCSI-ID selector is a push-button rotary selector with locking tabs.

Deltaic, Dynatek, FWB, MacTel, and Third Wave all use this style of ID selector. The worst method of SCSI-ID selection is the old-fashioned bank of DIP switches, still used by La Cie for its drives.

To function properly, the SCSI chain requires *termination* at both ends. Your Mac's internal drive is already terminated, but you must terminate the other end of the chain if your drive is the last device in the chain. Termination isn't a problem if the drive supports external termination or if internal termination can be controlled from outside the case, such as with the La Cie drives, which use an external switch for termination (unfortunately, though, it's a tiny DIP switch). Least convenient is internal termination that requires that you open the case and remove resistors; the drives from Cutting Edge,

Ehman, HDI, Liberty, Loviel, MacProducts, MacTel, MacTown, Rodime, Third Wave, and TMS Peripherals are all internally terminated.

On the other hand, Optima deserves a salute for the informative LEDs that indicate whether or not your SCSI chain is properly terminated that the company has built in to its terminating blocks. Such indicators are a boon for troubleshooting. Ultimately, we'd like vendors to successfully implement *active termination* — circuitry that terminates the drive automatically — so that users won't have to think about it. Although many vendors say that they're looking into active termination, none have yet implemented it.

In addition to taking all these SCSI details into account, our construction and design evaluations involved scoring drives for items such as power-

switch placement. Power switches belong on the front of the drive, so you don't have to grope to turn on your hard drive, and the switch should be recessed to prevent accidents. Unfortunately, all the vendors followed Apple's lead and put the power switches on the rear.

Solid, Sturdy Construction

Our drive deconstruction uncovered several products that have fully shielded, enclosed power supplies. Such power supplies offer safety and reliability — the shielding keeps the inquisitive safe from electrocution and protects the drive mechanism from electrical interference from the power supply. The three APS drives, the Loviel M210QUZF, the MacTel HD Index 210 MB, and the Optima Diskovery 200 all feature fully

Figure 3: Price Versus Design and Construction

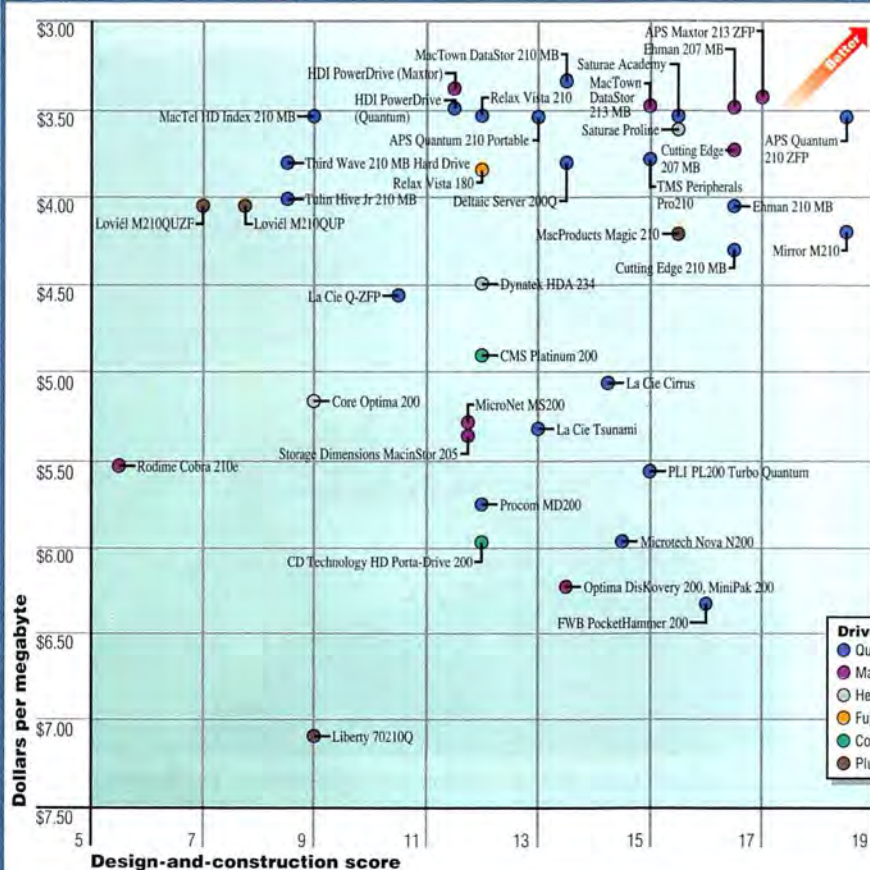


Figure 3: Speed cannot compensate for poor construction. We disassembled each drive to determine the best-designed and best-constructed. The APS Quantum 210 ZFP and Mirror M210 drives are the best-built: Each has a sturdy metal case and well-shielded power supply and SCSI cable. The Rodime Cobra 210e and the Loviel M210QUZF brought up the rear, with flimsy plastic cases, no AC outlets, and poorly constructed SCSI cables. Again, we plotted each drive's design-and-construction score along with its street price in dollars per megabyte.

shielded, enclosed power supplies.

Finally, we looked at additional assurances of safety, such as evidence of UL approval, which demonstrates that a product has passed electrical- and fire-safety tests developed by the Underwriters' Laboratories. Only four products — the PLI PL200 Turbo Quantum, the Rodime Cobra 210e, and the Storage Dimensions Macin-Stor205 as well as the Optima MiniPak 200's external transformer— were emblazoned with the UL label. UL approval alone is no assurance that a product is well made, though. For example, we rated the UL-approved Rodime Cobra 210e the lowest for

design and construction, because of its flimsy plastic case, internal termination, and unshielded power supply.

Designate a Drive

Although you can't completely avoid the effects of either dollar or data inflation, following this report's recommendations should help you dull the bite of both. Many drive vendors offer a variety of hard-drive mechanisms, which have different capacities, speeds, and warranties. Be sure you know which mechanism you want before calling for a price.

To increase the complexity of your purchasing decision, Quantum and

Fujitsu's new mechanisms are faster than those of the drives we tested for this report. Be sure to check which Fujitsu or Quantum mechanism you are buying.

Once you've narrowed the field to the vendors that offer the mechanism you want, check the accompanying figures and table to help you decide which of those vendors offer the combination of package, documentation, service, and warranty you require. For a look at our favorites, check the "Bottom Line" sidebar.

Winn L. Rosch offers all-purpose computer knowledge in *The Winn Rosch Hardware Bible*.



The Bottom Line

Any one of these 41 hard-disk systems will give you more than enough megabytes to withstand the next round of data inflation. However, six drives stand out from the rest by offering the best combinations of speed, sturdy construction, easy installation, and long-term support and security.

The **APS Quantum 210 ZFP** (\$699 direct) was simply the best-built drive we tested. Although its performance was near the middle of the pack, its price per megabyte was among the lowest. We'd choose it as a long-term survivor.

The **Mirror M210** (\$829 direct) almost equaled the APS Quantum 210 ZFP in construction quality. The Mirror M210 is more expensive but the company offers better support, so if you're willing to pay a bit more, you'll get a bit more with the M210.

The **Saturae Proline** (\$799 direct) and the **Core Optima 200** (\$1,429 list, \$1,143 street) were the fastest drives in our real-world tests. The speed scores of these drives, which are both based on the Hewlett-Packard mechanism, provide enough incentive to buy either of them — both also offer five-year warranties — but the Proline is of sturdier construction and has one of the lowest per-megabyte costs. Pick the Proline if speed and warranty are your top concerns.

Saturae's other drive, the **Saturae Academy** (\$699 direct), which is based on a Quantum mechanism, is as well constructed as the Proline and is also a top performer. With this drive, you get almost

the speed of the fastest drives and the same quality of construction.

The **TMS Peripherals Pro210** (\$745 direct) didn't stand out in any one test, but it never let us down. The combination of

better-than-average speed, design and construction quality, packaging, and support is a sum greater than its parts. This is a good choice for a general-purpose hard drive.



The overall best bets to beat data inflation (from left to right): the TMS Peripherals Pro210, Saturae Proline, APS Quantum 210 ZFP, Core Optima 200, Mirror M210, and Saturae Academy.






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CIRCLE 142 ON READER SERVICE CARD.

Table 1: Features of 200-Megabyte Hard Drives

● = yes ○ = no	APS Maxtor 213 ZFP ★★★★	APS Quantum 210 Portable ★★★★½	APS Quantum 210 ZFP ★★★★	CD Technology HD Porta-Drive 200 ★★★
List price	\$689	\$699	\$699	\$1,599
Street price	\$689	\$699	\$699	\$1,200
Pros	Inexpensive. Good SCSI cable. Good documentation. Metal case.	Good SCSI cable. Good documentation. Portable.	Good SCSI cable. Good documentation. Metal case.	Portable.
Cons		No external fuse.		Expensive. No SCSI cable. No external fuse. One-year warranty. No money-back guarantee. No guaranteed turnaround time for repairs.
Hardware				
Capacity (advert./actual)	213 MB/200.6 MB	210 MB/197.3 MB	210 MB/197.3 MB	212.6 MB/200.9 MB
Internal mechanism	Maxtor LXT-213SY	Quantum ProDrive 210S	Quantum ProDrive 210S	Conner CP-3200F
SCSI-ID selector	push button	push button	push button	push button
SCSI termination	external	external	external	external
Software and features				
Bundled software	18 MB of shareware	18 MB of shareware	18 MB of shareware	none
Formatter	Alliance Power Tools 2.06	Alliance Power Tools 2.06	Alliance Power Tools 2.06	Disk Manager Mac
Password protection	●	●	●	●
Data encryption	○	○	○	○
Disk optimizer	○	○	○	○
Backup	●	●	●	○
File recovery	○	○	○	○
Construction				
Indicator lights	access and power	access and power	access and power	access and power
Size (L x W x H)	10 x 9.5 x 2 in.	8 x 6 x 2.5 in.	10 x 9.5 x 2 in.	8.5 x 7 x 2 in.
Case material	metal	plastic with EMI coating	metal	plastic
Fuse	external and internal	internal	external and internal	internal
Fan	yes	no	yes	yes
AC outlets	yes	no	yes	no
Other				
Standard warranty	2 years	2 years	2 years	1 year
Service center	direct	direct	direct	direct or dealer
Money-back guarantee	30 days	30 days	30 days	○
Turnaround time	48 hours	48 hours	48 hours	○
Extended warranty	○	○	○	○
Toll-free tech support	●	●	●	○
Data-recovery service	○	○	○	●
Company				
	Alliance Peripheral Systems 2900 S. 291 Hwy. Independence, MO 64057 (800) 233-7550 (816) 478-8300	Alliance Peripheral Systems 2900 S. 291 Hwy. Independence, MO 64057 (800) 233-7550 (816) 478-8300	Alliance Peripheral Systems 2900 S. 291 Hwy. Independence, MO 64057 (800) 233-7550 (816) 478-8300	CD Technology 766 San Aleso Ave. Sunnyvale, CA 94086 (408) 752-8500

ATLAS PRO

A NEW DIMENSION IN DATA MANAGEMENT



Most business and government professionals view and analyze data only on spreadsheets, databases and occasionally in business graphics packages. While these types of software are useful for displaying statistical data, they fall short of communicating information about geography — such as income by sales territory, population by county, or customers by ZIP codes or street addresses.

Atlas Pro is changing that. By linking data from spreadsheets, databases and even other applications — on your Macintosh® or elsewhere in your AppleTalk™ network — you can now add the important geographical dimension to your information system.

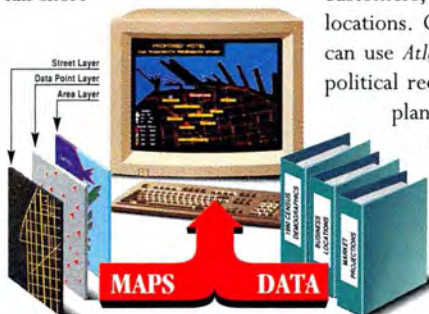
And when we say important, we mean mission critical. For example, Atlas Pro can help business professionals answer "what if" and "show me where" questions for optimizing sales territories, targeting customers, and selecting ideal site locations. Government professionals can use Atlas Pro for everything from political redistricting to land-use planning and public safety analysis. Without Atlas Pro these tasks would be difficult or impossible.

Atlas Pro comes equipped with a built-in data management spreadsheet, map importing and digitizing tools, a generous base map and data sampler from our comprehensive library, pie and bar

charting and powerful graphics enhancement tools.

Of course, Atlas Pro is completely System 7 "savvy." It supports everything from balloon help to publish and subscribe, the Data Access Manager, and Apple Events. It also runs fine on System 6, and there's a version for PC compatibles.

So if you're ready to add a dynamic new dimension to the way you use information, like 20,000 other Strategic Mapping customers, call us at (408) 985-7400 or fax us at (408) 985-0859 for a free Desktop Mapping Guidebook and demo disk. We'd be happy to map out a plan for you.



CIRCLE 186 ON READER SERVICE CARD.

Table 1: Features of 200-Megabyte Hard Drives, continued

● = yes ○ = no	CMS Platinum 200 \$\$\$½	Core Optima 200 \$\$\$½	Cutting Edge 207 MB \$\$\$½	Cutting Edge 210 MB \$\$\$½
List price	\$1,639	\$1,429	\$1,119	\$1,279
Street price	\$985	\$1,143	\$749	\$849
Pros	Good formatter. Good documentation. Metal case.	Fastest. Longest warranty.	Metal case.	Metal case.
Cons	Slow. No external fuse. One-year warranty. No money-back guarantee. No guaranteed turnaround time for repairs.	Fimsy case. Exposed internal wiring. No external fuse. No money-back guarantee. No guaranteed turnaround time for repairs.	Internal termination. Poor formatter. One-year warranty. No money-back guarantee. No guaranteed turnaround time for repairs.	Internal termination. Poor formatter. One-year warranty. No money-back guarantee. No guaranteed turnaround time for repairs.
Hardware				
Capacity (advert./actual)	212.6 MB/200.9 MB	234 MB/221.6 MB	207 MB/200.6 MB	210 MB/197.3 MB
Internal mechanism	Conner CP-3200F	HP C2233	Maxtor LXT-213SY	Quantum ProDrive 210S
SCSI-ID selector	push button	push button	push button	push button
SCSI termination	external	external	internal	internal
Software and features				
Bundled software	SUM II	SUM II	none	none
Formatter	CMS Utilities 7.0.2	Core Formatter 3.2	CE HDD Formatter	CE HDD Formatter
Password protection	●	●	○	○
Data encryption	●	●	○	○
Disk optimizer	●	●	○	○
Backup	●	●	○	○
File recovery	●	●	○	○
Construction				
Indicator lights	access	access and power	access and power	access and power
Size (L x W x H)	10.5 x 10 x 2.5 in.	8.5 x 7 x 2 in.	10.5 x 9.5 x 2.5 in.	10.5 x 9.5 x 2.5 in.
Case material	metal	plastic	metal	metal
Fuse	internal	internal	external and internal	external and internal
Fan	yes	yes	yes	yes
AC outlets	no	no	yes	yes
Other				
Standard warranty	1 year	5 years	1 year	1 year
Service center	dealer	direct or dealer	dealer	dealer
Money-back guarantee	○	○	○	○
Turnaround time	○	○	○	○
Extended warranty	○	○	○	○
Toll-free tech support	○	○	○	○
Data-recovery service	○	○	○	○
Company	CMS Enhancements, Inc. 2722 Michelson Dr. Irvine, CA 92715 (714) 222-6000	Core International, Inc. 7171 N. Federal Hwy. Boca Raton, FL 33487 (407) 997-6044	Cutting Edge 97 S. Red Willow Dr. P.O. Box 1259 Evanston, WY 82931 (307) 789-3830	Cutting Edge 97 S. Red Willow Dr. P.O. Box 1259 Evanston, WY 82931 (307) 789-3830

The Phaser III prints on paper bags, paper towels, toilet paper or anything else up to 80 lb. stock. Phaser and TekColor are trademarks of Tektronix, Inc. for color printers and related products. PostScript is a trademark of Adobe Systems Incorporated which is registered in the USA and other countries. Other marks are trademarks or registered trademarks of the manufacturers or marketers of the products with which the marks are associated.



It can take any color you throw at it.

Let's say you have this outrageous design. But your color printer just doesn't get it. Looks like a job for the new Phaser™ III.

It has the broadest range of colors available—16.7 million of them—all delivered at 300 dpi with TekColor™ and Pantone-approved color matching. You'll get brilliant color on *any* paper, from stationery to card stock. And it takes up to 12" x 18" so you can even print tabloid bleeds.

Ten MB RAM and a 24 MHz RISC chip make it the fastest printer controller around. And with Adobe's PostScript™ Language Level 2, your stuff will look great. So go ahead. Throw out the wildest idea you can think of. The Phaser III can take it. Call 1-800-835-6100, Dept. 18A for a free output sample.

CIRCLE 40 ON READER SERVICE CARD.

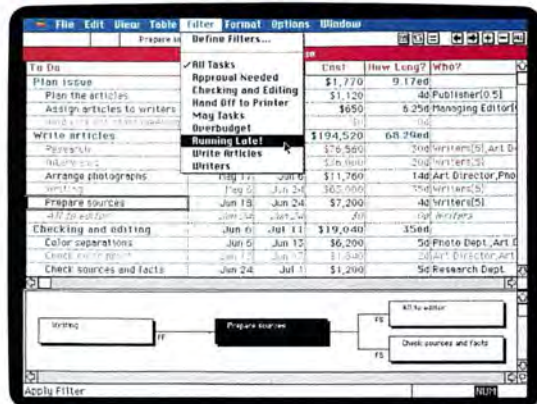
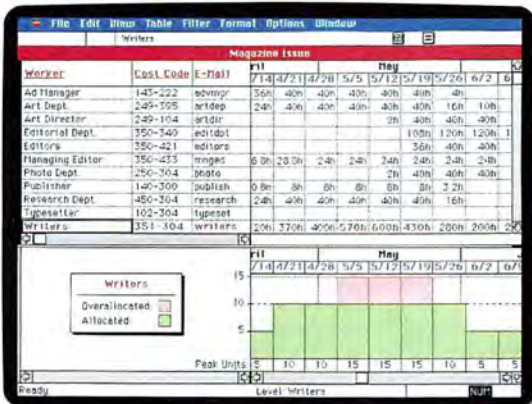
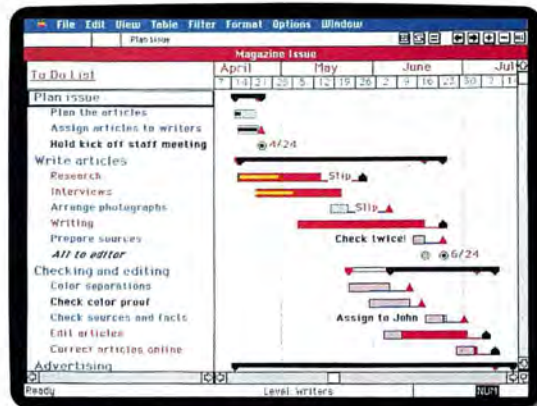
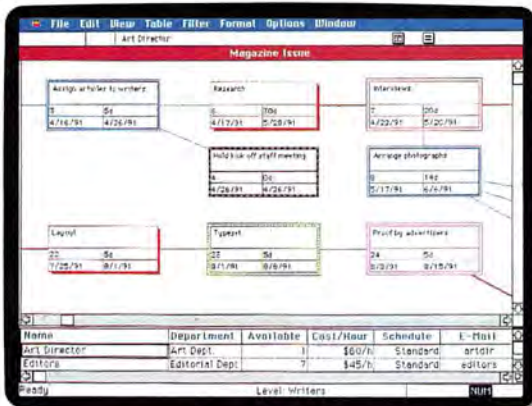


Tektronix
The best and the brightest

Table 1: Features of 200-Megabyte Hard Drives, continued

● = yes ○ = no	Deltaic Server 200Q \$\$\$½	Dynatek HDA 234 \$\$\$½	Ehman 207 MB \$\$\$½	Ehman 210 MB \$\$\$½
List price	\$749	\$1,329	\$699	\$799
Street price	\$749	\$995	\$699	\$799
Pros	Good documentation. Metal case.	Fast. Metal case. Local dealer support.	Inexpensive. Good documentation. Metal case.	Good documentation. Metal case.
Cons	Unshielded power supply. No money-back guarantee. No guaranteed turnaround time for repairs.	Unshielded power supply. No money-back guarantee. No guaranteed turnaround time for repairs.	Internal termination. No money-back guarantee. No guaranteed turnaround time for repairs.	Internal termination. No money-back guarantee. No guaranteed turnaround time for repairs.
Hardware				
Capacity (advert./actual)	210 MB/197.3 MB	234 MB/221.6 MB	213 MB/200.6 MB	210 MB/197.3 MB
Internal mechanism	Quantum ProDrive 210S	HP C2233	Maxtor LXT-213SY	Quantum ProDrive 210S
SCSI-ID selector	push button	push button	push button	push button
SCSI termination	external	external	internal	internal
Software and features				
Bundled software	none	none	none	none
Formatter	Deltaic System Installer	ComPass Utilities	Ehman HDD Formatter	Ehman HDD Formatter
Password protection	○	●	○	○
Data encryption	○	○	○	○
Disk optimizer	○	○	○	○
Backup	○	○	○	○
File recovery	○	○	○	○
Construction				
Indicator lights	access and power	access and power	access and power	access and power
Size (L x W x H)	10 x 9.5 x 2.5 in.	10 x 10 x 3 in.	10.5 x 9.5 x 2.5 in.	10.5 x 9.5 x 2.5 in.
Case material	metal	metal	metal	metal
Fuse	external and internal	external and internal	external and internal	external and internal
Fan	yes	yes	yes	yes
AC outlets	no	no	yes	yes
Other				
Standard warranty	2 years	2 years	2 years	2 years
Service center	direct	dealer	direct	direct
Money-back guarantee	○	○	○	○
Turnaround time	○	○	○	○
Extended warranty	○	○	○	○
Toll-free tech support	●	○	○	○
Data-recovery service	○	●	○	○
Company				
	Deltaic Systems, Inc. 1701 Junction Ct., #302B San Jose, CA 95112 (800) 745-1240 (408) 441-1240	Dynatek Automation Systems 15 Tangiers Rd. Toronto, Ontario M3J 2B1 Canada (416) 636-3000	Ehman, Inc. 97 S. Red Willow Dr. P.O. Box 2126 Evanston, WY 82931 (800) 257-1666 (307) 789-3830	Ehman, Inc. 97 S. Red Willow Dr. P.O. Box 2126 Evanston, WY 82931 (800) 257-1666 (307) 789-3830

Before you start your next project, check your options.



New Microsoft® Project for the Macintosh® lets you enter and view your data just about any way you choose. Customize reports to your liking. And schedule resources across multiple projects with ease.

But see for yourself. Call (800) 541-1261, Dept. Z24, to order your own \$9.95* working model. Then using that other project management program will be (whew!) optional.

Microsoft®

Table 1: Features of 200-Megabyte Hard Drives, continued

● = yes ○ = no	FWB PocketHammer 200 \$\$\$½	HDI PowerDrive (Maxtor) \$\$\$½	HDI PowerDrive (Quantum) \$\$\$½	La Cie Cirrus \$\$\$\$
List price	\$1,749	\$679	\$689	\$999
Street price	\$1,249	\$679	\$689	\$999
Pros	Excellent formatter. Excellent documentation. Metal case. Portable.	Metal case.	Metal case.	Switched termination.
Cons	Expensive. No money-back guarantee.	Internal termination. Unshielded power supply. No external fuse. One-year warranty. No guaranteed turnaround time for repairs.	Internal termination. Unshielded power supply. No external fuse. One-year warranty. No guaranteed turnaround time for repairs.	DIP switches. No external fuse. No money-back guarantee. No guaranteed turnaround time for repairs.
Hardware				
Capacity (advert./actual)	210 MB/197.3 MB	213 MB/200.7 MB	210 MB/197.3 MB	210 MB/197.3 MB
Internal mechanism	Quantum ProDrive 210S	Maxtor LXT-213SY	Quantum ProDrive 210S	Quantum ProDrive 210S
SCSI-ID selector	push button	push button	push button	DIP switches
SCSI termination	external	internal	internal	internal with ext. switch
Software and features				
Bundled software	Hard Disk ToolKit	none	none	10 MB of shareware
Formatter	Hammer Install 1.3d	Disk Manager Mac	Disk Manager Mac	Silverlining
Password protection	●	●	●	●
Data encryption	●	○	○	○
Disk optimizer	○	○	○	●
Backup	○	○	○	○
File recovery	○	○	○	○
Construction				
Indicator lights	access and power	access and power	access and power	none
Size (L x W x H)	8.5 x 6.5 x 3 in.	10.5 x 9.5 x 2.5 in.	10.5 x 9.5 x 2.5 in.	9.5 x 6.5 x 3 in.
Case material	metal	metal	metal	plastic with EMI coating
Fuse	external and internal	internal	internal	internal
Fan	yes	yes	yes	yes
AC outlets	no	no	no	no
Other				
Standard warranty	2 years	1 year	1 year	2 years
Service center	direct or dealer	direct	direct	direct or dealer
Money-back guarantee	○	30 days	30 days	○
Turnaround time	48 hours	○	○	○
Extended warranty	○	○	○	○
Toll-free tech support	○	●	●	●
Data-recovery service	○	●	●	●
Company	FWB, Inc. 2040 Polk St., Ste. 215 San Francisco, CA 94109 (415) 474-8055	Hard Drives International 1912 W. 4th St. Tempe, AZ 85281 (800) 767-3475 (602) 350-1128	Hard Drives International 1912 W. 4th St. Tempe, AZ 85281 (800) 767-3475 (602) 350-1128	La Cie Ltd. 19552 S.W. 90th Ct. Tualatin, OR 97062 (800) 999-0143 (503) 691-0771

Choose Your Standard



Infinity Turbo 88 Drive

The demands for high-capacity data storage have been steadily increasing. The most efficient way to increase data storage as your needs grow is with removable media and the Infinity Turbo 88.

- 80MB+ removable cartridge SCSI drive
- Faster access times and transfer rates
- 60,000 hours MTBF
- Lower cost-per-megabyte
- External switches for termination and SCSI address
- 5 year warranty on cartridge



Infinity Optical 3.5" Drive

The PLI Infinity Optical 3.5" optical cartridge drive is the latest in data storage technology! Each single-sided cartridge holds approximately 128MB of data. The new cartridges have all the reliability of their big brothers and offer one great advantage — the cartridges fit into your shirt pocket.

- 120MB+
- Faster access times and transfer rates
- ISO/ANSI standard
- Rewritable magneto-optical SCSI drive



Infinity Floptical 21MB Drive

This drive combines the familiarity and ease-of-use of floppy drives with the reliability of modern hard drives and opticals. What you get is the ability to read, write and format 720K, 1.44MB and 21MB floptical diskettes. Infinity Floptical 21MB is perfect for backups, archiving or transferring small to medium amounts of data across the office or — the world.

- Floptical diskettes have 21MB capacity
- Reads and writes 720K and 1.44MB floppies
- 80ms access time — much faster than standard floppies
- Optical tracking and ECC for high reliability
- External switches for termination and SCSI address
- Compatible with all Macintosh computers

Peripheral Land Incorporated
47421 Bayside Parkway • Fremont, California 94538
Phone 510-657-2211 or 800-288-8754 • Fax 510-683-9713
CIRCLE 181 ON READER SERVICE CARD.



Table 1: Features of 200-Megabyte Hard Drives, continued

● = yes ○ = no	La Cie Q-ZFP \$\$\$½	La Cie Tsunami \$\$\$½	Liberty 70210Q \$\$\$	Loviél M210QUP \$\$\$
List price	\$899	\$1,049	\$1,399	\$1,299
Street price	\$899	\$1,049	\$1,399	\$799
Pros	Switched termination. Metal case.	Switched termination. Portable.	Metal case. Carrying case provided. Portable.	Portable.
Cons	DIP switches. No external fuse. No money-back guarantee. No guaranteed turnaround time for repairs.	DIP switches. No external fuse. No money-back guarantee. No guaranteed turnaround time for repairs.	Highest street price. Internal termination. No formatter shipped. No external fuse. Poor documentation. No guaranteed turnaround time for repairs.	Internal termination. Flimsy case. No external fuse. No money-back guarantee. No guaranteed turnaround time for repairs.
Hardware				
Capacity (advert./actual)	210 MB/197.3 MB	210 MB/197.3 MB	210 MB/197.3 MB	210 MB/197.3 MB
Internal mechanism	Quantum ProDrive 210S	Quantum ProDrive 210S	Plus Impulse 210S	Plus Impulse 210S
SCSI-ID selector	DIP switches	DIP switches	dial	push button
SCSI termination	internal with ext. switch	internal with ext. switch	internal	internal
Software and features				
Bundled software	10 MB of shareware	10 MB of shareware	none	none
Formatter	Silverlining	Silverlining	SCSI Director	SCSI Director
Password protection	●	●	●	●
Data encryption	○	○	○	○
Disk optimizer	●	●	○	○
Backup	○	○	●	●
File recovery	○	○	○	○
Construction				
Indicator lights	access and power	access and power	access and power	access and power
Size (L x W x H)	9.5 x 9.5 x 2.5 in.	8.5 x 6 x 2.5 in.	7 x 5 x 2 in.	8.5 x 7 x 2.5 in.
Case material	metal	plastic with EMI coating	metal	plastic
Fuse	internal	internal	internal	internal
Fan	yes	yes	yes	yes
AC outlets	no	no	no	no
Other				
Standard warranty	2 years	2 years	1 year	2 years
Service center	direct or dealer	direct or dealer	none	none
Money-back guarantee	○	○	30 days	○
Turnaround time	○	○	○	○
Extended warranty	○	○	○	○
Toll-free tech support	●	●	○	○
Data-recovery service	●	●	○	○
Company				
	La Cie Ltd. 19552 S.W. 90th Ct. Tualatin, OR 97062 (800) 999-0143 (503) 691-0771	La Cie Ltd. 19552 S.W. 90th Ct. Tualatin, OR 97062 (800) 999-0143 (503) 691-0771	Liberty Systems, Inc. 160 Saratoga Ave., Ste. 38 Santa Clara, CA 95051 (408) 983-1127	Loviél Computer Corp. 5174 W. 76th St. Edina, MN 55439 (612) 835-3553

Dear Kate Letter

October 22, 1991

Dearest Ellen:

If there is anything better than being loved by you...it is loving you.

And you are so easy to love. You've brought such wonder into my life and have touched my heart with your love.

I just want you to know, my darling, that it feels so good being in love with you and I want to love you for a very long time.

You are a wonderful woman and I love you dearly. If I'm dreaming, please don't wake me up—I don't want this to end.

Monogamously yours,

1040

Departments
U.S. In

For the
or other

Your

Chr i

If a jo

Label
(See Instructions on page 8.)

Use IRS label. Otherwise, please print or type.

Presidential Election Campaign
(See page 9.)

Filing Status

Check only one box.

Exemptions
(See Instructions on page 10.)

PERSONAL

Normal

FILE PRINT SAVE MAIL ENCL CLIP REC OFF REPLY

FROM: Scott (11/14/91)

TO: Chris

CC:

BCC:

Subject: PERSONAL

Time: 1:24 PM

Date: 11/14/91

OFFICE MEMO

During a recent dinner at Chairman Binkenhimer's home, you stated that members of the Daughters of the American Revolution are "a bunch of old battle-axes."

Judging from the fact that you made this comment within earshot of the Chairman, you must not be aware that Mrs. B. is a founding member of the local D.A.R. chapter and holds the rank of Brigadier General.

Employee Evaluation

EMPLOYEE EVALUATION

EMPLOYEE NAME	EMPLOYEE #	DEPARTMENT
ANTHONY HALSTEIN	223	Administration

PERFORMANCE OF RESPONSIBILITIES:
Mr. Halstein distinguished himself as a reliable time administrator. But since Mr. Halstein's time position, this was considered unacceptable.

INTRA-OFFICE RELATIONS:
Mr. Halstein distinguished himself as a reliable person in various Departments, including Maintenance, resulting in a new account claim at the Out-Of-The-restaurant and hotels the rep.

CHARACTER ISSUES: Mr. H of the quad-county area. There s

OTHER COMMENTS: Details a in the wrath of the Chairman

RECOMMENDATIONS: Termin

Chris Resume

CHRISTOPHER S. KEENAN

Chris Party Invite

CELEBRATE!

I got a new job, LET'S PARTY!

Date: November 3

Time: 8PM

Place: Chris' Place
123 Unemployment Lane
555-1212

RSVP

And remember, don't tell anyone else at the office!!!

Your Mac can say a lot about you.

If somebody sat down at your Mac and started snooping around your disk, which would embarrass you more?

The details of your love life? Your resume? Your adjusted gross income?

How about the Confidential Employee Evaluation you were working on when the Boss hauled you into his office for a chat?

What? You never thought about this before? Then read on and you'll never have to think about it again.

All you'll have to think about is your password.

That's the key to DiskLock™, the painless, yet powerful, System 7 savvy way to keep other people's noses permanently out of both your personal and professional data.

You can password-protect selected files, folders or your entire hard disk. And encrypt everything to U.S. Government DES specs.

You don't even have to be there. DiskLock blanks your screen and secures your system for you — without interrupting your applications — whenever you wander off.

When you return, it asks for your password and lets you know if anyone got curious while you were away.

If you're curious about DiskLock, or about our one-year money-back guarantee, call 1-800-666-2904.

We'll give you all the juicy details.



FIFTH GENERATION SYSTEMS, INC

CIRCLE 102 ON READER SERVICE CARD.

Table 1: Features of 200-Megabyte Hard Drives, continued

● = yes ○ = no	Loviél M210QUZF \$\$\$	MacProducts Magic 210 \$\$\$½	MacTel HD Index 210 MB \$\$\$	MacTown DataStor 210 MB \$\$\$½
List price	\$1,299	\$830	\$749	\$659
Street price	\$799	\$830	\$749	\$659
Pros		Metal case.	Inexpensive.	Inexpensive.
Cons	Internal termination. Flimsy case. No external fuse. No money-back guarantee. No guaranteed turnaround time for repairs.	Internal termination. No money-back guarantee. No guaranteed turnaround time for repairs.	Internal termination. Poor documentation. No money-back guarantee. No guaranteed turnaround time for repairs.	Internal termination. Poor documentation. No money-back guarantee.
Hardware				
Capacity (advert./actual)	210 MB/197.3 MB	210 MB/197.3 MB	210 MB/197.3 MB	210 MB/197.3 MB
Internal mechanism	Plus Impulse 210S	Plus Impulse 210S	Quantum ProDrive 210S	Quantum ProDrive 210S
SCSI-ID selector	push button	push button	push button	push button
SCSI termination	internal	internal	internal	internal
Software and features				
Bundled software	none	none	Backamatic, AutoSave	none
Formatter	SCSI Director	Disk Manager Mac	Index HD Utilities Installer	Dataware
Password protection	●	●	○	●
Data encryption	○	○	○	○
Disk optimizer	○	○	○	○
Backup	●	○	○	○
File recovery	○	○	○	○
Construction				
Indicator lights	access and power	access and power	access and power	access and power
Size (L x W x H)	10.5 x 10 x 2.5 in.	10 x 9.5 x 2.5 in.	10 x 10 x 2.5 in.	10 x 9.5 x 2.5 in.
Case material	plastic	metal	plastic with EMI coating	plastic
Fuse	internal	external and internal	external and internal	external and internal
Fan	yes	yes	yes	yes
AC outlets	no	yes	no	yes
Other				
Standard warranty	2 years	2 years	2 years	1 year
Service center	none	direct	direct	dealer
Money-back guarantee	○	○	○	○
Turnaround time	○	○	○	24 hours
Extended warranty	○	○	○	○
Toll-free tech support	○	○	○	●
Data-recovery service	○	●	○	○
Company	Loviél Computer Corp. 5174 W. 76th St. Edina, MN 55439 (612) 835-3553	MacProducts USA 608 W. 22nd St. Austin, TX 78705 (512) 472-8881	MacTel Technology 3007 N. Lamar Austin, TX 78705 (800) 950-8411 (512) 451-2600	Data Storage Marketing, Inc. 5718 Central Ave. Boulder, CO 80301 (800) 543-6098 (303) 442-4747

Think MicroNet...



...When You Need the Highest Performance From the Quadra 700 and Quadra 900 - Nothing's More Powerful Than Our Data Storage Solutions.

If you're looking for the most powerful hard disk, rewritable optical, and tape backup systems for the Apple Quadra, we invite you to think MicroNet.

Think of our RAVEN-040 disk arrays when you need up to 4,260 MB of unbelievably fast hard disk storage. With 7.0 MB/sec sustained transfers and a significantly reduced access time of 5.5 ms, it's no wonder RAVEN-040 is the MacUser Eddy Award winner for the Best Storage Product of 1991.

What's more, the RAVEN-040 uses both high performance SCSI ports of the Quadra 900, leaving all five NuBus slots open for other devices.

Think of our internal rewritable optical systems when you want removable storage for the Quadra 900.

MicroNet's new 3.5" optical drive has a fast access time of 38 ms. And it lets you affordably store 128 MB of data on a shirt-pocket-size disk.

Think of MicroNet's single hard drive systems for the Quadra 700 and 900 when you need up to 2,130 MB of reliable SCSI data storage. And if it's removable cartridge drives or tape backup you're looking for, MicroNet offers 44 and 88 MB SyQuest cartridge systems, and streaming tape and DAT backup to 5.0 GB.

So when you need the most powerful hard disk and removable data storage systems for the Quadra 700 and 900, think MicroNet.

Call our Sales Department today for the name of a Reseller near you. 1-714-837-6033.



MicroNet Technology, Inc.

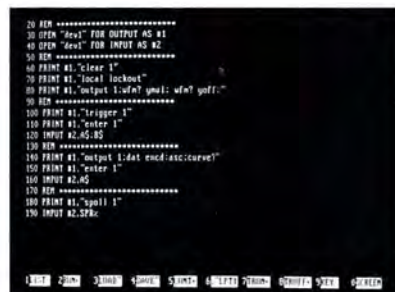
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CIRCLE 138 ON READER SERVICE CARD.

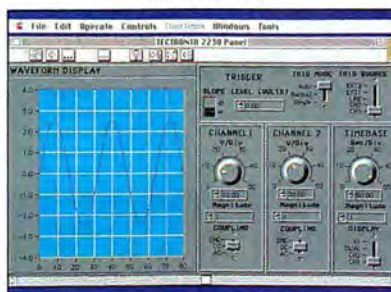
Table 1: Features of 200-Megabyte Hard Drives, continued

● = yes ○ = no	MacTown DataStor 213 MB \$\$\$½	MicroNet MS200 \$\$\$½	Microtech Nova N200 \$\$\$½	Mirror M210 \$\$\$\$
List price	\$699	\$1,445	\$1,699	\$829
Street price	\$699	\$1,059	\$1,178	\$829
Pros	Inexpensive.	Good SCSI cable. Good documentation.	Expensive. Good SCSI cable. Good documentation.	Good SCSI cable. Metal case.
Cons	Internal termination. Poor documentation. One-year warranty. No money-back guarantee.	Flimsy case. No external fuse. One-year warranty. No money-back guarantee.	Unshielded power supply. No money-back guarantee.	Unshielded power supply.
Hardware				
Capacity (advert./actual)	213 MB/200.6 MB	213 MB/200.7 MB	210 MB/197.3 MB	210 MB/197.3 MB
Internal mechanism	Maxtor LXT-213SY	Maxtor LXT-213SY	Quantum ProDrive 210S	Quantum ProDrive 210S
SCSI-ID selector	push button	push button	push button	push button
SCSI termination	internal	external	external	external
Software and features				
Bundled software	none	none	Norton Utilities	Gofer, Inside Information, 10 MB of shareware
Formatter	Dataware	MicroNet Utilities 5.1.7	Hard Disk Formatter	Mirror Media Manager
Password protection	●	●	○	●
Data encryption	○	○	○	○
Disk optimizer	○	○	●	○
Backup	○	○	○	●
File recovery	○	○	●	○
Construction				
Indicator lights	access and power	access and power	access and power	access and power
Size (L x W x H)	10 x 9.5 x 2.5 in.	10.5 x 9.5 x 2.5 in.	10.5 x 9.5 x 2.5 in.	11 x 9.5 x 2 in.
Case material	plastic	plastic	plastic with EMI coating	metal
Fuse	external and internal	internal	external and internal	external and internal
Fan	yes	yes	yes	yes
AC outlets	yes	no	no	yes
Other				
Standard warranty	1 year	1 year	5 years	2 years
Service center	dealer	direct or dealer	direct	direct
Money-back guarantee	○	○	○	30 days
Turnaround time	48 hours	48 hours	48 hours	48 hours
Extended warranty	○	1 year (\$129)	○	○
Toll-free tech support	●	○	●	○
Data-recovery service	○	○	○	○
Company	Data Storage Marketing, Inc. 5718 Central Ave. Boulder, CO 80301 (800) 543-6098 (303) 442-4747	MicroNet Technology 20 Mason Irvine, CA 92718 (714) 837-6033	Microtech International, Inc. 158 Commerce St. East Haven, CT 06512 (800) 626-4276 (203) 468-6223	Mirror Technologies 2644 Patton Rd. Roseville, MN 55113 (800) 654-5294 (612) 633-4450

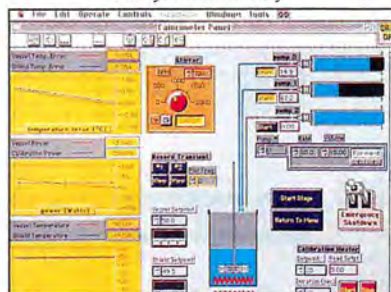


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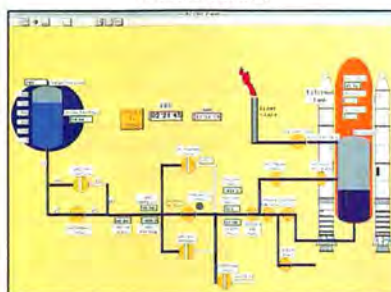
Automated Test



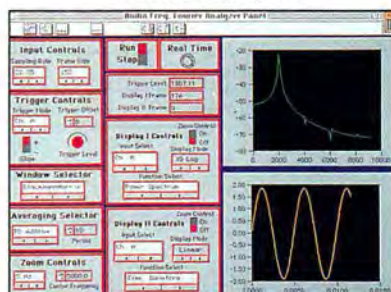
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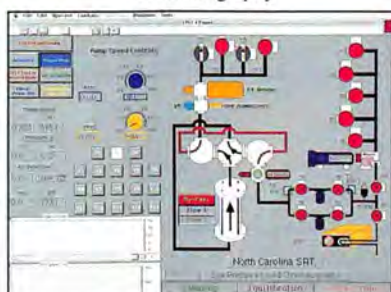
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Table 1: Features of 200-Megabyte Hard Drives, continued

● = yes ○ = no	Optima DiskKover 200 \$\$\$½	Optima MiniPak 200 \$\$\$½	PLI PL200 Turbo Quantum \$\$\$½	Procom MD200 \$\$\$
List price	\$1,895	\$1,895	\$1,199	\$1,555
Street price	\$1,250	\$1,250	\$1,099	\$1,135
Pros	Good SCSI cable. Good documentation.	Good SCSI cable. Good documentation.	External fuse.	Good SCSI cable. Good documentation.
Cons	Expensive. Flimsy case. No external fuse. One-year warranty. No money-back guarantee. No guaranteed turnaround time for repairs.	Expensive. Flimsy case. No external fuse. One-year warranty. No money-back guarantee. No guaranteed turnaround time for repairs.	Poor manual illustrations. One-year warranty. No money-back guarantee. No guaranteed turnaround time for repairs.	Flimsy case. No external fuse. One-year warranty. No money-back guarantee. No guaranteed turnaround time for repairs.
Hardware				
Capacity (advert./actual)	210 MB/200.6 MB	210 MB/200.6 MB	210 MB/197.3 MB	210 MB/197.3 MB
Internal mechanism	Maxtor LXT-213SY	Maxtor LXT-213SY	Quantum ProDrive 210S	Quantum ProDrive 210S
SCSI-ID selector	push button	push button	dial	dial
SCSI termination	external	external	external	external
Software and features				
Bundled software	disk-mirroring software	disk-mirroring software	12 MB of shareware	none
Formatter	Optima DiskMount	Optima DiskMount	PLI Formatter	Procom 3.04
Password protection	●	●	○	●
Data encryption	○	○	○	○
Disk optimizer	○	○	●	○
Backup	○	○	●	○
File recovery	○	○	○	○
Construction				
Indicator lights	access and power	access and power	access	access and power
Size (L x W x H)	10 x 11.5 x 2.5 in.	8 x 6 x 2.5 in.	9.5 x 9.5 x 2.5 in.	10.5 x 9.5 x 2.5 in.
Case material	plastic	plastic	metal	plastic
Fuse	internal	internal	external and internal	internal
Fan	yes	yes	yes	yes
AC outlets	no	no	no	no
Other				
Standard warranty	1 year	1 year	1 year	1 year
Service center	direct or dealer	direct or dealer	direct or dealer	dealer
Money-back guarantee	○	○	○	○
Turnaround time	○	○	○	○
Extended warranty	3 years	3 years	○	○
Toll-free tech support	○	○	○	○
Data-recovery service	○	○	○	○
Company	Optima Technology Corp. 17526 Von Karman Irvine, CA 92714 (714) 476-0515	Optima Technology Corp. 17526 Von Karman Irvine, CA 92714 (714) 476-0515	Peripheral Land, Inc. 47421 Bayside Pkwy. Fremont, CA 94538 (800) 288-8754 (510) 657-2211	Procom Technology, Inc. P.O. Box 8975 Newport Beach, CA 92658 (714) 549-9449

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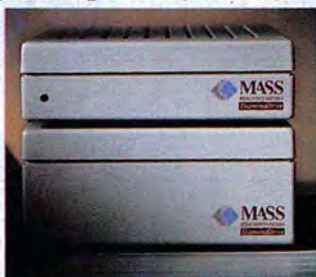


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CIRCLE 158 ON READER SERVICE CARD.

Table 1: Features of 200-Megabyte Hard Drives, continued

● = yes ○ = no	Relax Vista 180 †††	Relax Vista 210 †††½	Rodime Cobra 210e †††	Saturae Academy ††††
List price	\$659	\$699	\$1,799	\$699
Street price	\$659	\$699	\$1,110	\$699
Pros	Good documentation. Metal case.	Good documentation. Metal case.	Good bundled software. Good documentation.	Fast. Good documentation. Metal case.
Cons	Slowest. Poor formatter. No external fuse.	Poor formatter. No external fuse.	Internal termination. Flimsy case. Unshielded power supply. No external fuse. No money-back guarantee. No guaranteed turnaround time for repairs.	No money-back guarantee.
Hardware				
Capacity (advert./actual)	180 MB/171.7 MB	210 MB/197.3 MB	210 MB/206 MB	210 MB/197.3 MB
Internal mechanism	Fujitsu M2614SA	Quantum ProDrive 210S	Maxtor LXT-213SY	Quantum ProDrive 210S
SCSI-ID selector	push button	push button	push button	push button
SCSI termination	external	external	internal	external
Software and features				
Bundled software	none	none	Mac Tools Deluxe	none
Formatter	Relax Installer 1.13	Relax Installer 1.13	Cobra Driver Utility	Dataware 2.0.1
Password protection	○	○	●	●
Data encryption	○	○	●	○
Disk optimizer	○	○	●	○
Backup	○	○	●	○
File recovery	○	○	●	○
Construction				
Indicator lights	access and power	access and power	access and power	access and power
Size (L x W x H)	11 x 10 x 2.5 in.	11 x 10 x 2.5 in.	9.5 x 9.5 x 2.5 in.	10 x 9.5 x 2.5 in.
Case material	metal	metal	plastic	metal
Fuse	internal	internal	internal	external and internal
Fan	yes	yes	yes	yes
AC outlets	no	no	no	yes
Other				
Standard warranty	3 years	2 years	2 years	2 years
Service center	direct	direct	direct or dealer	direct
Money-back guarantee	30 days	30 days	○	○
Turnaround time	48 hours	48 hours	○	48 hours
Extended warranty	○	○	○	○
Toll-free tech support	○	○	○	●
Data-recovery service	○	○	○	○
Company				
	Relax Technology 3101 Whipple Rd. Union City, CA 94587 (510) 471-6112	Relax Technology 3101 Whipple Rd. Union City, CA 94587 (510) 471-6112	Rodime Systems, Inc. 7700 W. Camino Real Boca Raton, FL 33433 (407) 994-5585	Saturae Corp. 148 Richdale Ave. Cambridge, MA 02140 (800) 373-3063 (617) 661-8166

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You would be surprised at the number of people who have confided with me the fact that they've given up trying to learn some of the programs. They put the box on the shelf and write the expenditure off as a bad investment.

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Can you imagine how much money has been wasted on programs and computers that are sitting abandoned? Right now think of the people working on Macs in your office. Do they really understand the computer? Do they know what to do when it goes down? How many programs are each of our people using? Have they really mastered the programs they're using? Do they know the short-cuts and valuable techniques that will save you time, money, and increase our professionalism?

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Freehand Part 3	<input type="checkbox"/>
MacDraw Pro Part 1	<input type="checkbox"/>
MacDraw Pro Part 2	<input type="checkbox"/>
Canvas 3.0 Part 1	<input type="checkbox"/>
Canvas 3.0 Part 2	<input type="checkbox"/>
Canvas 3.0 Part 3	<input type="checkbox"/>
SuperPaint 3.0 Part 1	<input type="checkbox"/>
SuperPaint 3.0 Part 2	<input type="checkbox"/>
SuperPaint 3.0 Part 3	<input type="checkbox"/>
PageMaker Part 1	<input type="checkbox"/>
PageMaker Part 2	<input type="checkbox"/>
PageMaker Part 3	<input type="checkbox"/>
PageMaker Part 4 (New)	<input type="checkbox"/>
QuarkXPress Part 1	<input type="checkbox"/>
QuarkXPress Part 2	<input type="checkbox"/>
QuarkXPress Part 3	<input type="checkbox"/>
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Photoshop Part 1	<input type="checkbox"/>
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ClarisWorks Spreadsheet 2	<input type="checkbox"/>
ClarisWorks Database 3	<input type="checkbox"/>
ClarisWorks Graphics & Com. 4	<input type="checkbox"/>
FileMaker Pro Part 1	<input type="checkbox"/>
FileMaker Pro Part 2	<input type="checkbox"/>
FileMaker Pro Part 3	<input type="checkbox"/>
Word 5.0 Part 1	<input type="checkbox"/>
Word 5.0 Part 2	<input type="checkbox"/>
Word 5.0 Part 3	<input type="checkbox"/>
Persuasion Part 1	<input type="checkbox"/>
Persuasion Part 2	<input type="checkbox"/>

CIRCLE 83 ON READER SERVICE CARD.

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Table 1: Features of 200-Megabyte Hard Drives, continued

● = yes ○ = no	Saturae Proline ★★★★½	Storage Dimensions MacinStor 205 ★★★★½	Third Wave 210 MB Hard Drive ★★★★½	TMS Peripherals Pro210 ★★★★
List price	\$799	\$1,509	\$749	\$745
Street price	\$799	\$1,075	\$749	\$745
Pros	Fast. Good documentation. Metal case. Five-year warranty.	Good SCSI cable. Good documentation.	Good documentation.	Metal case.
Cons	No money-back guarantee.	Flimsy case. No external fuse. No money-back guarantee. No guaranteed turnaround time for repairs.	Internal termination.	Internal termination. Poor documentation. No money-back guarantee.
Hardware				
Capacity (advert./actual)	234 MB/221.6 MB	205 MB/200.7 MB	210 MB/197.3 MB	210 MB/197.3 MB
Internal mechanism	HP C2233	Maxtor LXT-213SY	Quantum ProDrive 210S	Quantum ProDrive 210S
SCSI-ID selector	push button	push button	push button	push button
SCSI termination	external	external	internal	internal
Software and features				
Bundled software	none	none	none	26 MB of shareware
Formatter	Dataware 2.0.1	MacinStor 3.0.2	Disk Manager Mac	TMS Diskwriter/Formatter
Password protection	●	●	●	●
Data encryption	○	○	○	○
Disk optimizer	○	○	○	○
Backup	○	○	○	○
File recovery	○	○	○	○
Construction				
Indicator lights	access and power	access and power	access and power	access and power
Size (L x W x H)	10 x 9.5 x 2.5 in.	10.5 x 9.5 x 2 in.	10 x 9.5 x 2.5 in.	10 x 9.5 x 2 in.
Case material	metal	plastic	plastic with EMI coating	metal
Fuse	external and internal	internal	external and internal	external and internal
Fan	yes	yes	yes	yes
AC outlets	yes	no	no	yes
Other				
Standard warranty	5 years	2 years	2 years	2 years
Service center	direct	direct or dealer	direct or dealer	direct
Money-back guarantee	○	○	●	○
Turnaround time	48 hours	○	48 hours	48 hours
Extended warranty	○	○	○	○
Toll-free tech support	●	○	○	●
Data-recovery service	○	○	●	○
Company				
	Saturae Corp. 148 Richdale Ave. Cambridge, MA 02140 (800) 373-3063 (617) 661-8166	Storage Dimensions 2145 Hamilton Ave. San Jose, CA 95125 (408) 879-0300	Third Wave Computing, Inc. 1826-B Kramer Ln. Austin, TX 78758 (800) 284-0486 (512) 832-8282	TMS Peripherals 23123 S.W. 58th Ave. Boca Raton, FL 33428 (800) 626-6347 (407) 998-9928

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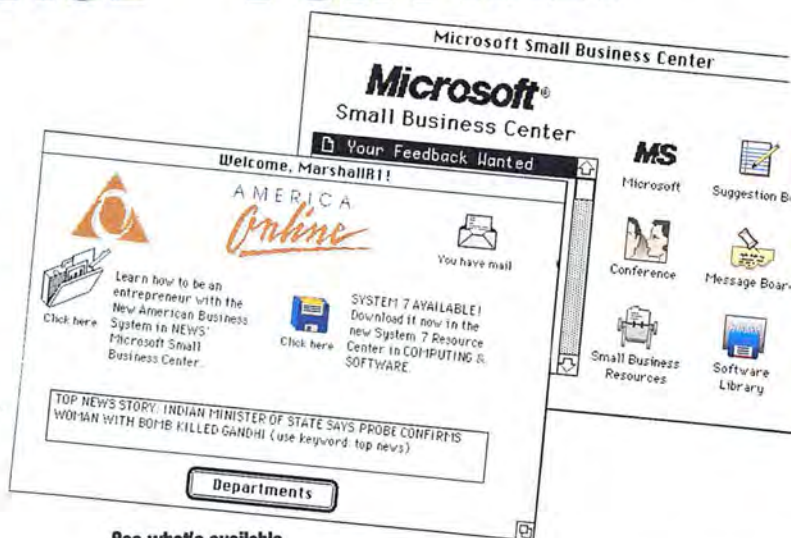
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Table 1, continued

● = yes ○ = no	Tulin Hive Jr 210 MB †††
List price	\$789
Street price	\$789
Pros	
Cons	Poor documentation. No external fuse. No warranty. No money-back guarantee. No guaranteed turnaround time for repairs.
Hardware	
Capacity (advert./actual)	210 MB/197 MB
Internal mechanism	Quantum ProDrive 210S
SCSI-ID selector	push button
SCSI termination	external
Software and features	
Bundled software	none
Formatter	Spot On
Password protection	●
Data encryption	○
Disk optimizer	○
Backup	○
File recovery	○
Construction	
Indicator lights	access and power
Size (L x W x H)	7.5 x 7 x 2 in.
Case material	plastic
Fuse	internal
Fan	yes
AC outlets	no
Other	
Standard warranty	none*
Service center	direct
Money-back guarantee	○
Turnaround time	○
Extended warranty	○
Toll-free tech support	○
Data-recovery service	○
Company	Tulin Corp. 2156 O'Toole Ave. San Jose, CA 95131 (408) 432-9025

*Tulin claims to offer a two-year warranty, but the box contained no warranty information.

Table 1 Criteria

List price — The manufacturer's suggested retail price for the hard-disk drive.

Street price — The average actual price charged by a sample of dealers around the U.S. in November 1991.

Capacity (advert./actual) — The advertised capacity of a drive and the actual formatted capacity (usable storage space). The former typically differs from the latter.

Internal mechanism — The OEM model name of the disk mechanism used in the drive. Prior to purchase, have the vendor confirm a specific model's internal mechanism.

SCSI-ID selector — The control that is used for changing the SCSI ID.

SCSI termination — The location or type of termination.

Bundled software — Commercial applications, utilities, or shareware that vendors include with their drive as well as software developed exclusively for their drives.

Formatter — The software that was shipped with the hard-disk drive at the time of testing that prepares the drive for use with a Macintosh.

Password protection — Does the drive's software provide a method for limiting access?

Data encryption — Does the drive's software provide a method of scrambling the drive's contents to prevent others from accessing the data unless they have a password?

Disk optimizer — Is the drive bundled with utility software for reorganizing its contents into contiguous blocks to improve its performance?

Backup — Does the drive come with software that copies files from the drive to other media for safekeeping?

File recovery — Does the drive come with a utility for rescuing deleted or damaged files?

Indicator lights — What the lights (if any) on the front of the drive indicate.

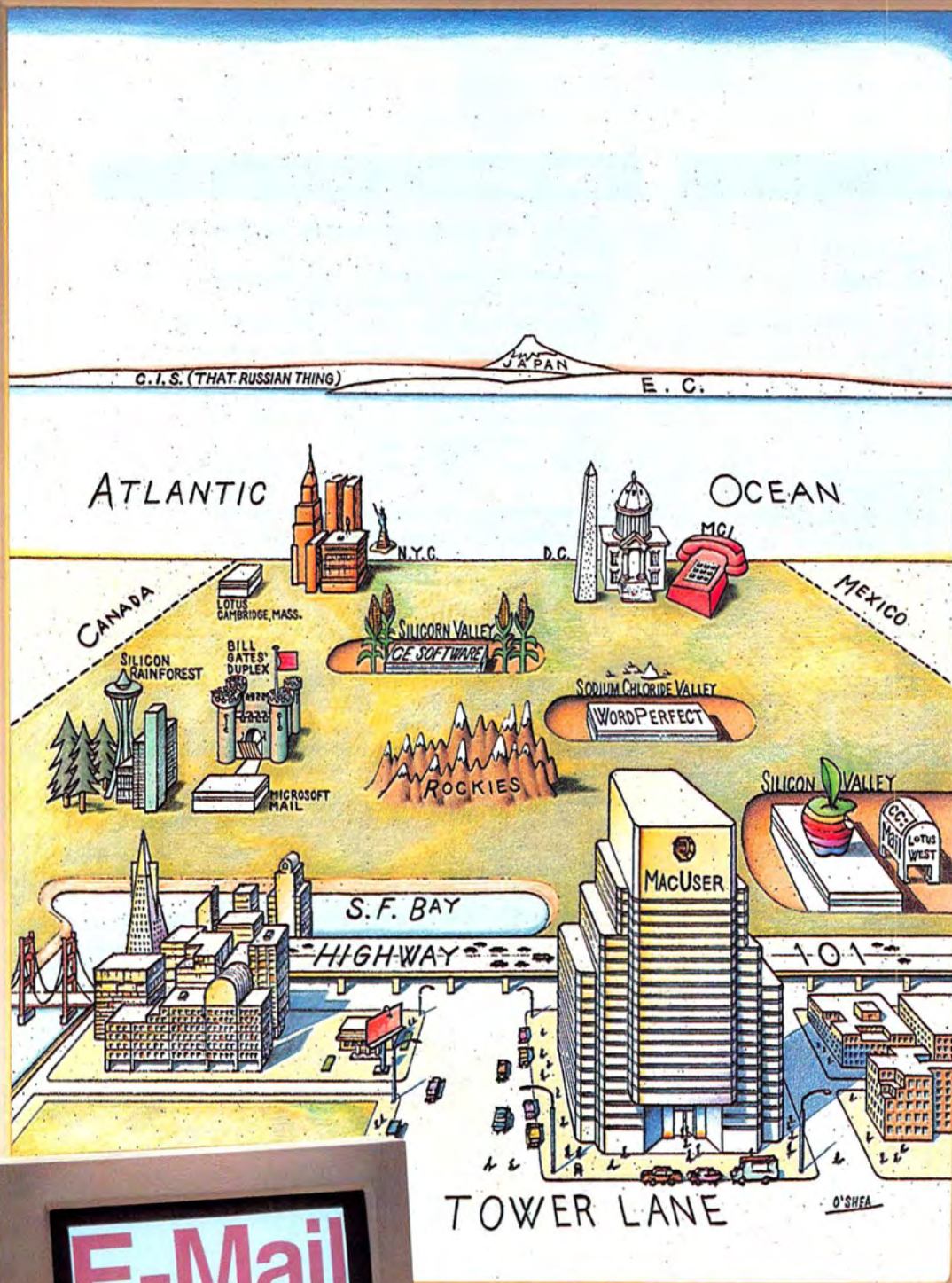
Case material — The primary material that is used for the drive's case.

Fuse — Is the drive internally and/or externally fused?

Fan — Does the drive contain a fan to keep it cool?

AC outlets — Does the drive have an AC outlet? If it does, for drives in this report, the outlet is switched, meaning that power goes to the outlet when you turn on the drive.

Turnaround time — The time within which the vendor guarantees delivery of a working drive if your drive fails.



The Global Network: E-Mail Gateways

Put the ever-expanding E-mail universe into perspective. MacUser Labs looks at two gateways that let you tap in to the global network.

**BY MICHAEL MILEY, KELLI WISETH,
AND THE MACUSER LABS STAFF**

Junk mail takes on a whole new meaning when electronic mail's involved. A few days before last Christmas, ads for everything from diskette refrigerator magnets to canvas coverlettes for the Mac Classic drifted into a bunch of *MacUser* QuickMail boxes. Enclosed with the come-ons were images of the various doodads and order forms — returnable by E-mail, of course. Who were the high-tech marketers, and how did their digital bulk-rate mail find its way to us?

As it turns out, the Case of the Mysterious E-Mail Messages is easy to solve. With E-mail *gateways* cropping up on networks from coast to coast, communicating with people on distant networks, even those using different E-mail systems, has gotten a lot easier. No more arcane command strings or cryptic addressing schemes that look like the comic-strip equivalent of [expletive deleted]: You know — something like @BOFFO.com! With the right E-mail gateway installed on your E-mail server, you can correspond around the globe as easily as you do around the office.

How It Works: E-Mail Gateways

QuickMail clients



An E-mail gateway enables communication between different E-mail systems. A gateway between a Macintosh E-mail system such as QuickMail and a VAX E-mail system such as All-in-1 — for example, MailMate/QM or GatorMail-Q — lets QuickMail and All-in-1 users exchange messages. Users on each system address their mail just as they always do, and the E-mail gateway takes care of converting messages into a form that's acceptable to the other system.

Because QuickMail is the most popular E-mail package, you'll find more gateways available for it than for any other E-mail program.

QuickMail server and modem



QM Server

- Manages the gateway's MailCenter.
- Notifies QuickMail users of waiting mail.



QM Administrator application

- Matches Connect message addresses and passes mail to the QuickMail server.
- Passes control to the gateway when it's time to send messages.



QM-Connect Gateway

- Dials the local Connect number.
- Sends all messages waiting to go to Connect from the gateway MailCenter.
- Downloads all messages from Connect addressed to QuickMail users at the gateway MailCenter.



QM-Connect Gateway MailCenter folder

- Acts as a holding place for incoming and outgoing messages.

Connect mainframe



Local Connect access number



Local Connect access number

E-mail clients



E-mail server and modem



Easy Access

Many kinds of E-mail gateways are offered by E-mail-application vendors and third-party developers alike. Depending on the gateway, Mac-based E-mail users can easily and transparently send messages to users of many other kinds of E-mail systems. *Proprietary gateways* — more accurately called *bridges* — connect geographically dispersed yet identical E-mail systems. Take, for example, the case

of a clothing wholesaler using CE Software's QuickMail for its companywide E-mail system: The personnel department on Fifth Avenue can exchange mail with the payroll department on Park Avenue via CE Software's QM-QM Bridge (included in the QuickMail package).

E-mail gateways can also enable communication among dissimilar E-mail systems. If your company's accounting department has a VAX and

uses Digital's All-In-One mail system but the legal department has Macs and uses Microsoft Mail, users on both systems can exchange mail easily and transparently if Alisa System's MailMate/MM gateway is installed on the Microsoft Mail server (see the "Gateway Directory" sidebar).

Such *cross-platform* E-mail gateways are great for enhancing companywide communication. But what if you need to keep an independent

satellite sales office in Saint George in the loop? And also swap mail with a consultant in Chinook? If each has a different E-mail system, you'll need a separate E-mail gateway for each of them. In such cases, it may be more cost-effective to use a public E-mail service, such as MCI Mail or AT&T Mail, or the mail service of one of the many information services — CompuServe, Prodigy, or Connect, for example — to send E-mail back and forth (see the "How It Works: E-Mail Gateways" sidebar). And with a gateway from your E-mail system to any of these services, you can send E-mail without getting involved with telecommunications programs, modems, and the like.

For this report, MacUserLabs looked at two gateways that let users of the two highest-rated Mac E-mail packages — Microsoft Mail and QuickMail — send messages to subscribers to two popular public mail services. Solutions' CommGATE for MCI Mail (\$395/five users) lets Microsoft Mail users send messages to and receive them from MCI Mail subscribers. (At press time, the entire Solutions product line was for sale; contact Microsoft or MCI Mail for current purchasing information about CommGATE for MCI Mail.) QM-Connect Gateway (\$100), from CE Software, lets QuickMail users send messages to and receive them from Connect subscribers. Both packages streamline the process of communicating with subscribers to either of these services.

Why Buy a Gateway?

Public E-mail services, such as AT&T EasyLink and MCI Mail, provide electronic mail and related services — telex and fax, for example. Public information services, such as CompuServe, Connect, and GEnie, are primarily business reference services that also provide E-mail services for their customers. For a fee, both types of service allow you to exchange mail with other subscribers, using the host system.

Using these services, however,

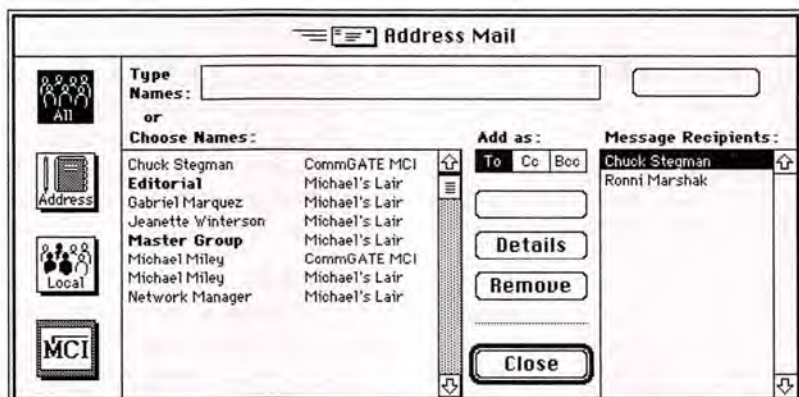


Figure 1: After the network administrator has set up MCI Mail recipient addresses on the server, they look just like any other Microsoft Mail address. Users can click on the MCI icon to get this dialog box for manually addressing a message to MCI subscribers not on the address list.

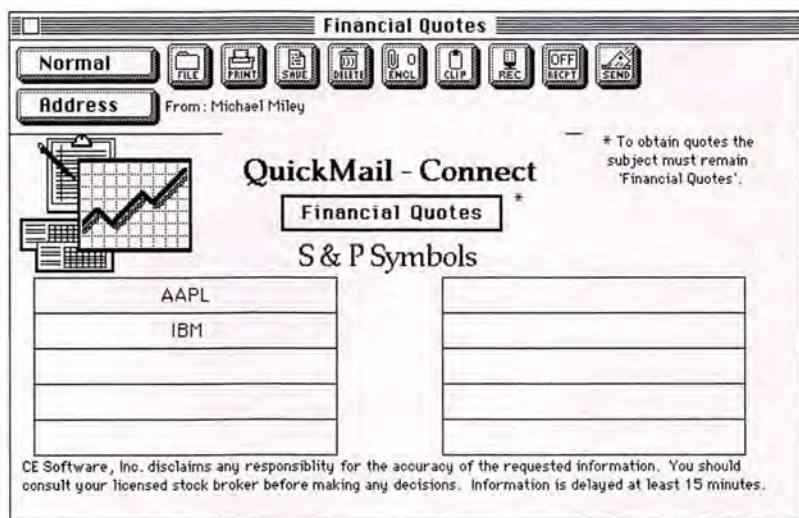


Figure 2: With QM-Connect Gateway and CE Software's Financial Quotes form, QuickMail users can check the price of stocks as reported over Standard & Poor's on-line financial-quotes service. The subject-field text — Financial Quotes — is used by the gateway to direct the message to the Connect host. The Standard & Poor's ticker-tape stock symbols — AAPL for Apple, for instance — are used to gather information for the stocks you specify.

typically requires that you use a *terminal-emulation* program to dial up the service via modem, log on to the host system, and send and receive mail. At first glance, this may not seem too cumbersome, but you'll want more ease of access than this if you're exchanging messages regularly via these public services. CE Software provides QM-Script Gateway, a unique alternative to terminal-emulation programs that enables QuickMail users to send

messages to a variety of text-based host services, free with the QuickMail server software. But if numerous QuickMail users want to communicate via the host system or if you want to use many other host-system features, QM-Script Gateway quickly becomes more trouble to administer than it's worth (see the "Scripts and Gateways" sidebar).

In contrast to QM-Script Gateway, an E-mail gateway to a public mail

service lets a large number of Mac E-mail users send messages to public-mail-service subscribers easily and transparently and typically supports more of the host service's features — the ability to send telexes or faxes or to retrieve stock quotes from a database, for example. Your choice of an E-mail gateway will be limited by the Mac E-mail system you're using and the commercial service through which you want to send messages. Not all host services offer the same sorts of features, so if you aren't yet a subscriber, be sure to shop carefully.

An E-mail gateway typically performs a dial-up on a scheduled basis

and exchanges mail with the host service. The gateway software is installed on the mail-server Mac, which needs a modem, access to a phone line, and enough free space on its hard disk to store incoming and outgoing messages. Some gateways require a dedicated phone line; others don't.

CommGATE

The CommGATE gateway lets Microsoft Mail users easily send and receive messages through MCI Mail. CommGATE is easy to install. Network administrators copy the gateway software and associated files into the System Folder of the Mac that's acting

as the Microsoft Mail server. The Gateway Installer program automatically installs the gateway on the server. The network administrator then logs on to the mail server, using the Microsoft Mail DA, and performs the rest of the setup steps: configuring the gateway, setting the connection times, creating user accounts, and creating a list of recipients. During setup, network administrators can also create a *gateway-access server*, which makes CommGATE accessible to users on other Microsoft Mail servers on the network.

You configure the gateway by entering the telecommunications-related

Gateway Directory

Gateways open up a wide world of communications to local-area-network E-mail users. Regardless of the many diverse types of E-mail systems your organization may have, chances are that there's a gateway available that will let your E-mail system send mail to users of a different E-mail system.

This directory contains a list of products that let you send mail from the five popular Mac store-and-forward E-mail systems reviewed last month (see "Stamp of Approval: Mac E-Mail Systems," March '92, page 158) to other types of mail systems — DOS-, UNIX-, VAX-, and mainframe-based — as well as to public mail and information services. (Note that gateways for cc:Mail and WordPerfect Office are designed for the DOS version of the software. If you want to tap in to any of the systems supported by these gateways, you'll have to start by tapping in to the DOS version of cc:Mail and you'll need the cc:Mail gateway to do this from your Mac network.)

Sometimes gateways offer support for more than one type of E-mail system or messaging protocol, so be sure to get more information before buying anything.

cc:Mail

•Cross-platform gateways

cc:Mail, Inc.
A division of Lotus Development Corp.
2141 Landings Drive
Mountain View, CA 94043
(800) 448-2500
(415) 961-8800
cc:Mail Gateway, \$1,295
cc:Mail Link to 3Com Mail, \$695
cc:Mail Link to SMTP, \$2,995
cc:Mail Link to Soft*Switch, \$995
cc:Mail Link to UNIXMail/UUCP, \$695
cc:Mail Link to X.400, \$1,995
cc:Mail PROFSlink, \$2,200

•Gateways to commercial E-mail services

cc:Mail, Inc.
A division of Lotus Development Corp.
2141 Landings Drive
Mountain View, CA 94043
(800) 448-2500
(415) 961-8800
cc:Mail EZlink, \$695
cc:Mail Link to MCI Mail, \$1,295
cc:Mail Telelink, \$695

Touch Communications, Inc.

250 E. Hacienda Avenue
Campbell, CA 95008
(408) 374-2500
Worldtalk 400 Gateway for cc:Mail, \$295 (gateway), \$295 (server), \$6,900/100 users

InBox Plus

•Cross-platform gateways

StarNine Technologies, Inc.
2126 Sixth Street
Berkeley, CA 94710
(510) 548-0391
Mail*Link Remote, \$195 and up
Mail*Link SMTP 2.0, \$595

Touch Communications, Inc.

250 E. Hacienda Avenue
Campbell, CA 95008
(408) 374-2500
Worldtalk 400 Gateway for Sitka InBox Plus, \$295 (gateway), \$295 (server), \$6,900/100 users

Microsoft Mail

•Cross-platform gateways

Alisa Systems, Inc.
221 E. Walnut Street, Suite 230
Pasadena, CA 91101
(800) 628-3274
(818) 792-9474
MailMate/MM, \$450/10 users

Cayman Systems, Inc.

26 Landsdowne Street
Cambridge, MA 02139
(800) 473-4776
(617) 494-1999
GatorMail-M, \$595/10 users

StarNine Technologies, Inc.

2126 Sixth Street
Berkeley, CA 94710
(510) 548-0391
Mail*Link MHS for Microsoft Mail, \$395/10 users
Mail*Link Remote, \$395/10 users
Mail*Link SMTP, \$595/10 users

settings for the modem- and phone-line connections in the Gateway Configurations dialog box — whether the telephone line is pulse or touch-tone, the local MCI Mail phone number, and which of the Mac's two serial ports (modem or printer) the modem is connected to. The times to send and receive MCI Mail can be specified in the Gateway Connect Times dialog box. Connection can be limited to certain times or can be initiated whenever there's mail headed for an MCI account. You cannot specify the number of redial attempts, however.

Next, the network administrator builds the list of Microsoft Mail users

who will be sending and receiving MCI Mail messages through the gateway, by setting up *gateway accounts*. MCI offers two types of accounts: Individual and EMS (electronic-mail system). Individual accounts can have more than one user, but the *default* user — designated by the system administrator during setup — receives all mail and must then forward it to the appropriate recipients. EMS accounts can also have any number of users, each of whom can send and receive messages. The network administrator must enter account-specific information — the MCI Mail account name, number, and password and whether it's an EMS or

an Individual account — when defining a gateway account and is the only one who can add users to a specific account.

The network administrator must also build a list of CommGATE *recipients*, MCI Mail subscribers who will be receiving Microsoft Mail messages, specifying the delivery mode besides the name and the MCI ID. All types of MCI Mail delivery are supported — Individual, EMS, Paper, Telex, Fax, and X.400. Individual and EMS messages are delivered electronically, by Microsoft Mail; the other methods follow MCI routing according to information set up in the Define

**•Gateways to commercial
E-mail services**

Microsoft Corp.

One Microsoft Way
Redmond, WA 98052
(800) 426-9400
(206) 882-8080

Microsoft Mail Gateway to AppleLink, free
(posted on AppleLink)

Solutions, Inc.

Contact Microsoft for information.

Microsoft Corp.

One Microsoft Way
Redmond, WA 98052
(800) 426-9400
(206) 882-8080

CommGATE (for MCI Mail), \$395/5 users

GlobalGATE (for AT&T EasyLink), \$395/5 users

Touch Communications, Inc.

250 E. Hacienda Avenue
Campbell, CA 95008
(408) 374-2500

Worldtalk 400 Gateway for Microsoft Mail,
\$295 (gateway), \$295 (server),
\$6,900/100 users

QuickMail

•Cross-platform gateways

Alisa Systems, Inc.

221 E. Walnut Street, Suite 230
Pasadena, CA 91101
(800) 628-3274
(818) 792-9474

MailMate/QM, \$450/10 users

Cayman Systems, Inc.

26 Landsdowne Street
Cambridge, MA 02139
(800) 473-4776
(617) 494-1999

GatorMail-Q, \$595/10 users

Information Electronics

520 W. Lake Road
Hammondsport, NY 14840
(607) 868-3331
SMTP/QM, \$599
UMCP/QM, \$199

InterCon Systems Corp.

950 Herndon Parkway
Herndon, VA 22070
(703) 709-9890
Dispatcher/SMTP, \$995

StarNine Technologies, Inc.

2126 Sixth Street
Berkeley, CA 94710
(510) 548-0391

Mail*Link MHS, \$395/10 users

Mail*Link QM-MS, \$2,995

Mail*Link Remote, \$395/10 users

Mail*Link SMTP, \$595/10 users

Touch Communications, Inc.

250 E. Hacienda Avenue
Campbell, CA 95008
(408) 374-2500

Worldtalk 400 Gateway for QuickMail, \$295
(gateway), \$295 (server), \$6,900/100 users

•Gateways to commercial

E-mail services

CE Software, Inc.

1801 Industrial Circle
P.O. Box 65580
West Des Moines, IA 50265
(800) 523-7638
(515) 224-1995

QM-Connect Gateway, \$100

GE Information Services

401 N. Washington Street
Rockville, MD 20850
(800) 638-8730
(301) 340-4000

QuickMail LAN Connector, \$695

Solutions, Inc.

Contact CE Software for information.

CE Software, Inc.

1801 Industrial Circle
P.O. Box 65580
West Des Moines, IA 50265
(800) 523-7638
(515) 224-1995

CommGATE/QM (for QuickMail), \$395/5 users

GlobalGate (for AT&T EasyLink), \$395/5 users

WordPerfect Office

•Cross-platform gateways

WordPerfect Corp.

1555 N. Technology Way
Orem, UT 84057
(801) 225-5000

WordPerfect Office Gateway to Retix

OpenServer 400, \$995

WordPerfect Office MHS Gateway, \$495

WordPerfect Office PCGate, free with

WordPerfect Office

•Gateways to commercial

E-mail services

WordPerfect Corp.

1555 N. Technology Way
Orem, UT 84057
(801) 225-5000

WordPerfect Office EasyLink Gateway, \$495

WordPerfect Office MCI Mail Gateway, \$495

Gateway Recipients dialog box for each recipient. Paper messages, for example, are routed to the MCI Mail service bureau whose ZIP code is nearest the recipient's — the full address is detailed in the Define Gateway Recipients dialog box — and delivered by the U.S. Postal Service.

With the gateway installed and all users registered to mail accounts, sending mail to MCI Mail recipients is just like sending any other Microsoft Mail message. MCI Mail can receive only text messages; nontext Microsoft Mail messages — graphical forms — are incompatible with MCI Mail. Messages for Individual or EMS recipients can include enclosures, but

messages for recipients with Paper, Telex, and Fax addresses cannot. Recipients need something that can read enclosures, though, so before sending mail, make sure your recipient has CommGATE, DeskTop Express, or Lotus Express. You can manually address messages to recipients who aren't in your address list, using a one-time addressing form. You need to know the MCI Mail ID number and the correct name on the MCI Mail account.

Outgoing mail is sent to the server in the same way as any other Microsoft Mail message is. The Microsoft Mail server initiates the dial-up to MCI Mail either at the specified connection time or immediately if the "Connect

immediately when there is outgoing mail" option was selected during configuration. If there's no outgoing mail, you can't force a connection — so if an out-of-state sales team's report is waiting for you in your MCI account, it'll just have to wait. When the connection is made, the mail server sends the mail; receives mail waiting for MCI accounts; and disconnects when it's finished, freeing the telephone line.

QM-Connect Gateway

CE Software's QM-Connect Gateway lets QuickMail users easily send and receive messages and files through the Connect Professional Information Service. Unlike CommGATE, QM-Connect Gateway requires a dedicated telephone line; like CommGATE, QM-Connect Gateway is easy to install on the QuickMail-server Mac. The network administrator simply copies the gateway software and related files into the appropriate folder on the server; creates a QM-Connect Gateway MailCenter; and designates a custodian for the MailCenter, much as is the case in Microsoft Mail's default scheme for shared-account messaging. As with MCI Mail, Connect offers group accounts, but group-account users must complete the ATTN and Sentby lines for return mail for delivery to the right desktop.

The gateway must then be configured with dial-up times and telecommunications settings: the telephone number, the number of retries if connection fails, and the times or the number of messages that will initiate dial-up. The settings dialog box for QM-Connect Gateway offers a few more options than CommGATE's does. You can select connection times for CommGATE in two-hour intervals — 12 A.M. to 2 A.M., for example — whereas QM-Connect Gateway lets you set the start and stop times and adjust the time, in minutes, between dial-up attempts. If you want to initiate dial-up when a certain number of messages are in the MailCenter, you can designate two numbers, one for messages of any priority and the other

Scripts and Gateways

Of all the Mac E-mail vendors, CE Software alone offers a low-cost method (it's free) of communicating between an E-mail application and many of the public E-mail services. The QuickMail package includes QM-Script Gateway, which provides scripts that let QuickMail users exchange messages with any text-based information service, such as CompuServe, GENie, and MCI Mail. You can also write your own scripts; information about how to do so is included in the manual for QuickMail administrators. Note that the host service must be *text-based*, which is why you can't write your own scripts for non-text-based on-line services — Connect or America Online, for example — and you cannot send enclosures.

Technically speaking, QM-Script Gateway isn't a true gateway but simply a means of automating log-on to and the exchange of mail with the host system. Network administrators install QM-Script Gateway on the mail server and create a QM-Script Gateway MailCenter for every MCI Mail-subscriber account that will send mail through the script gateway. If six QuickMail users on a network have individual MCI Mail accounts, you'll need six QM-Script Gateway MailCenters. And the QuickMail server will log on, exchange mail, and log off six times — once for each MailCenter.

MCI and other on-line services offer *group* accounts in addition to *individual* accounts. MCI's group account, called EMS (electronic-mail system), lets multiple E-mail users send mail through MCI Mail by using

one account number. Multiple users can send mail through the QM-Script Gateway MailCenter if those users share the same EMS account number; the network administrator creates only one MailCenter for those users.

Scripts used with QM-Script Gateway are limited to E-mail exchange. If you want to make use of the host's other services — delivery via MCI Mail's Paper, Telex, or Fax service bureaus, for example — the network administrator must set up a separate script for each. QM-Script Gateway simply manages dialing up the host system, downloading the messages intended for the QuickMail network, and sending the messages addressed to subscribers to the host system.

A true gateway, on the other hand, provides E-mail support for more features of the host system, without the administrative hassles. At press time, Solutions' gateway between QuickMail and MCI Mail — CommGATE/QM — was in beta testing; it may be available by the time you read this. Unlike QM-Script Gateway, CommGATE/QM processes all accounts — individual and EMS alike — through a single MailCenter and supports all the delivery methods of the MCI Mail host, such as Paper, Telex, and Fax. QM-Script Gateway, with its scripts to different commercial mail services, is best suited to those who have only a few users and don't need any of the host's features other than mail exchange.

— Kelli Wiseth

for urgent messages only. CommGATE, on the other hand, lets you specify only a connection time to send or that dial-up should be initiated if you receive one message, regardless of priority.

The network administrator must create a list of account users and custodians and a list of recipients. Users can then select recipients from their address lists. Alternatively, they can use the Special Address feature to address mail manually if they know the recipient's account name and number as well as the name of the MailCenter and the zone in which the gateway is housed.

When the designated time or number of messages in the gateway MailCenter is reached, QM-Connect Gateway dials up the local Connect phone number and logs on to Connect. The network administrator can also initiate the connection manually through the QM Administrator software, so you can pick up mail that's waiting at the MCI Mail mainframe even if it's before your scheduled dial-up time or when your QuickMail network has no outgoing messages. Mail is exchanged for the first account in the list, and then the gateway cycles through the remaining accounts, receiving and sending mail. Connect is finicky about account numbers: If any of them are invalid, the phone call is cut off and the other accounts in the queue will not exchange mail with Connect. Before the gateway will process mail for the remaining accounts, the network administrator must remove or correct the invalid account number. Furthermore, if the gateway is configured so that only account custodians can send mail, any mail sent by noncustodians will just sit in the MailCenter.

QuickMail users who are Connect subscribers can also incorporate QuickMail's Financial Quotes and Financial Report forms to receive stock quotations or commodity and mutual-fund financials through the gateway (see Figure 2). When combined with CE Software's QM-DataCollection Bridge (\$150), QM-Connect Gateway

Table 1: Features


	CommGATE	QM-Connect Gateway
List price	\$395/5 users	\$100
Ideal users	Microsoft Mail users who want to exchange mail with MCI Mail subscribers.	QuickMail users who want to exchange mail with Connect subscribers.
Contact	Microsoft Corp. One Microsoft Way Redmond, WA 98052 (800) 426-9400 (206) 882-8080	CE Software, Inc. 1801 Industrial Circle P.O. Box 65580 West Des Moines, IA 50265 (800) 523-7638 (515) 224-1995

is even more useful. QuickMail users can collect data from Connect and then import that data into databases and spreadsheets, adding value to the financial data they've downloaded from the service.

The Gateway Advantage

Sending E-mail to folks on other E-mail systems can be done in a variety of ways, but one fairly effective method is to make use of the E-mail services of a commercial provider such as AT&T EasyLink, MCI Mail, CompuServe, Connect, or GENie. And you can gain even more efficiency if you tie your E-mail system to the commercial service by means of an E-mail gateway. An E-mail gateway lets you send mail to

other E-mail users — even those on non-Mac systems — using the familiar front end of your Mac E-mail system. The commercial service provides a place to exchange messages.

Both CommGATE and QM-Connect Gateway can be straightforward, streamlined additions to your Microsoft Mail and QuickMail systems, respectively. Each gateway is seamlessly integrated with its server-based mail system and provides many useful business features. 

San Francisco-based free-lance writer Michael Miley won the Computer Press Association's Best Software Review award for "Mail Call," his 1990 *MacUser* lab report on electronic mail. Kelli Wiseth is a *MacUser* senior editor.

The Bottom Line

With an E-mail gateway connecting your Mac E-mail system to a commercial E-mail service, everyone in the office can send mail to distant correspondents as easily as they do to the cubicle next door. And you save some money too: When you send mail via a host service, your connection is typically to a local or toll-free number.

Your choice of a gateway depends on several factors, including which Mac E-mail package your company has now and to which commercial mail or information service you subscribe. Before signing up, compare costs and features. And whichever service you choose, think about what type of accounts you want to set up — group or individual. Group accounts may offer a cost

savings, but individual accounts offer confidentiality and efficient routing to the right desktop.

CE Software's **QM-Connect Gateway** (\$100) is easy to install and administer, and it lets QuickMail users send messages directly to users of the Connect Professional Information Service. CE Software provides forms that enable easy accessing of financial information through Connect.

Solution's **CommGATE** (\$395/five users) lets Microsoft Mail users connect to MCI Mail and provides full support for Paper, Telex, Fax, and X.400 messaging. CommGATE supports both EMS and Individual accounts and sends incoming messages directly to the addressee.

Full-Featured File Service: AppleShare Server 3.0

*Apple's new file-server software adds features
while keeping pace with its predecessor —
but is it a good reason to buy a Quadra?*

●
BY HENRY BORTMAN AND THE MACUSER LABS STAFF

When the Quadra 900 was introduced late last year, it was declared the perfect file server. Glowing advertisements touted room for multiple storage devices, NuBus slots galore, dual SCSI ports, and a power supply hefty enough to keep everything humming. There was, however, one catch — and it was a big one: The Quadra couldn't run AppleShare File Server 2.0.1, because that version could not run under System 7, and the Quadra does not run under System 6.



Macintosh
Quadra 900

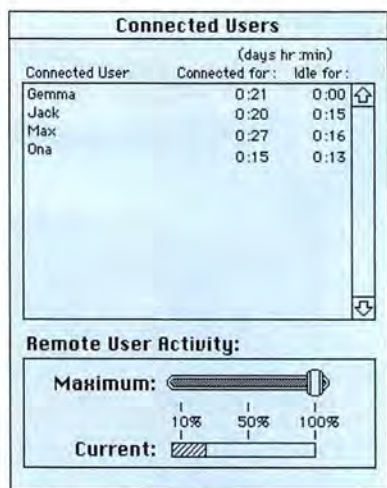


Figure 1: Multiple applications can run simultaneously on an AppleShare Server 3.0 server. The network administrator can set the maximum amount of activity to be dedicated to file-server tasks.

Premature Evaluation

We were eager to test Apple's solution, AppleShare 3.0 File Server, but it wasn't shipping when the Quadra was introduced. The file-server software is one of the components of the AppleShare Server 3.0 package. The package also contains AppleShare 3.0 Print Server, server-administration software, and workstation software for Mac as well as Apple II users. This review focuses only on the Mac software. Last fall, we tested a beta version of AppleShare 3.0 File Server to see if the new version significantly improved on the sometimes poky performance of its predecessor. However, when we ran the beta version through our basic set of file-server benchmark tests (see "A New Way to Share," December '91, page 199), we discovered that although AppleShare 3.0 File Server was long on new features, it was short on performance.

Performance problems are not surprising with beta software — the final tweaks given to an application right before it ships are often just what it needs to bring it up to speed. So, when we got a shipping copy of AppleShare Server 3.0, we put the file-server software through its paces in our NetWorkShop, assuming that performance

would improve over the beta version — and it did. We also discovered, however, that for small to medium-sized networks, the Quadra 900 may not be the superfast server platform we had hoped it would be.

Get With the System

One significant difference between AppleShare File Server 2.0.1 and AppleShare 3.0 File Server is that version 2.0.1 ran only under System 6 and version 3.0 requires System 7. (Note: Client Macs that access shared files on the server do not need to have System 7. They can continue to run under the same system and use the same AppleShare client software that they used when connected with servers running AppleShare File Server 2.0.1. However, Apple recommends that they use the AppleShare 3.0 workstation software that ships with the AppleShare Server 3.0 package.)

One major benefit of a System 7-based server is that it can run multiple applications simultaneously. AppleShare File Server 2.0.1, on the other hand, was a dedicated server: Once it was installed, it could simultaneously run only one foreground application — such as the AppleShare Admin program or AppleShare Print Server

2.0.1 — and programs specifically written to run in the background on the server. If you wanted to run any other foreground software, the server had to be shut down first.

This isn't the case with AppleShare 3.0 File Server. It can be kept running while you run as many other programs as your Mac's RAM can support. The server needs at least 4 megabytes of RAM to run AppleShare 3.0 File Server and more in order to run multiple applications. Other convenient applications might include AppleShare 3.0 Print Server, an E-mail server, a multiuser database manager, network-administration programs — any network-minded application that can run under System 7. The network administrator can specify the maximum amount of CPU horsepower that the server Mac will dedicate to file-server functions (see Figure 1).

New Versatility

In addition to its ability to run simultaneously with other applications, AppleShare Server 3.0 offers new flexibility in several other ways. Users won't notice much difference between accessing a 2.0.1 server and a 3.0 server, but network managers will be very grateful for some of the improvements.

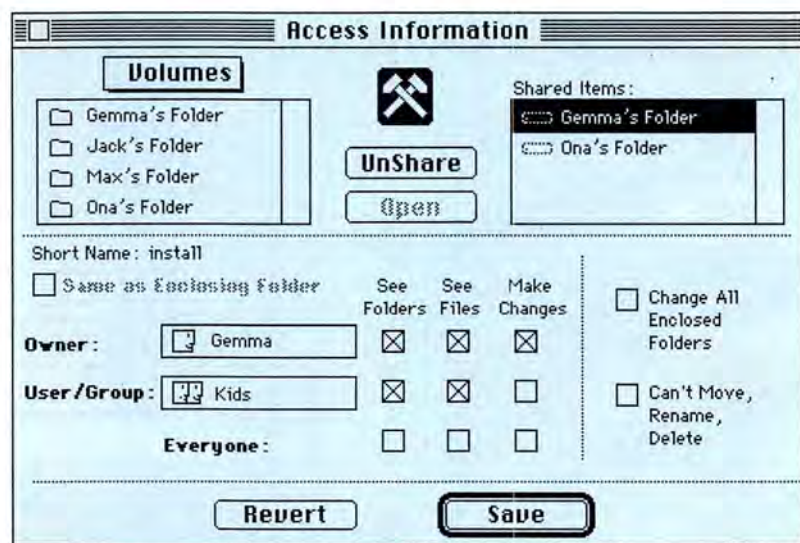


Figure 2: AppleShare 3.0 File Server, like System 7 file sharing, lets you share folders as server volumes and set shared-item privileges.

Mounting/Dismounting Volumes.

With AppleShare File Server 2.0.1, only entire disk volumes could be shared as server volumes and the network administrator had to shut down the server to mount or dismount a volume. AppleShare 3.0 File Server, like System 7 file sharing, lets either entire disks or selected folders on a disk be shared as server volumes (see Figure 2). It's also possible to mount and dismount drives and eject removable media such as CD-ROMs while the server is running.

Access Privileges. AppleShare has three levels of access privileges — Owner, Group, and Everyone — that can be assigned to folders on shared volumes. AppleShare 3.0 File Server expands on the group privilege by letting a folder's owner assign a special set of privileges to one other user rather than to a group of users. This is handy if, for example, you want to set aside certain data that you plan to access remotely by dialing in to the network while you're on the road.

AppleShare 3.0 File Server adopts a convention used by System 7 file sharing, known as *inherited* privileges, when assigning privileges to newly created folders on a server volume. Have you ever had the following unpleasant experience with AppleShare File Server 2.0.1? You create a new folder on a server volume and drag it into someone else's drop folder. But that person can't open it, because it was created with your default privileges, which made the folder accessible only by you. And you can't access it either, because you don't have the privileges to open the recipient's folder.

Things are better now. AppleShare workstation software version 7.0, which ships with System 7, went partway: When you create a new folder with AppleShare workstation software 7.0, it inherits the privileges of the folder in which it's created. AppleShare 3.0 File Server goes the rest of the way: When you create a folder and move it to another folder on the server, it adopts the privileges of that folder. Only if

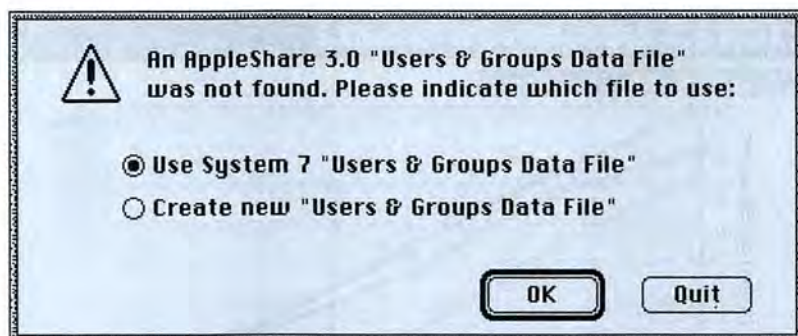


Figure 3: When upgrading to AppleShare 3.0 File Server from either AppleShare File Server 2.0.1 or System 7 file sharing, you can retain the information in your existing Users & Groups data file.



Figure 4: AppleShare 3.0 File Server allows as many as 120 simultaneous users and provides several new password-related security features.

you deliberately change its privileges does it retain explicit privileges when you move it around.

By the way, although the AppleShare 3.0 workstation software, which ships with AppleShare Server 3.0, may seem like a step—or four—backward from 7.0, the 3.0 version is actually newer than the 7.0 version, which ships with System 7. When installing AppleShare 3.0 File Server, network managers should make sure to upgrade users with the AppleShare Server 3.0 workstation software.

Upgrading. AppleShare Server 3.0

provides an easy means of upgrading from either AppleShare 2.0.1 or System 7 file sharing. If you have created Users & Groups privileges with either file service, the first time you run the AppleShare server-administration program, you'll see a dialog box that lets you choose whether you want to use the existing Users & Groups data file or create a new one (see Figure 3). Using the existing file can save a lot of time and effort. Note, however, that if you install AppleShare 3.0 File Server on a Macintosh that is already running System 7 file sharing, its file-sharing

Figure 5: AppleShare Performance

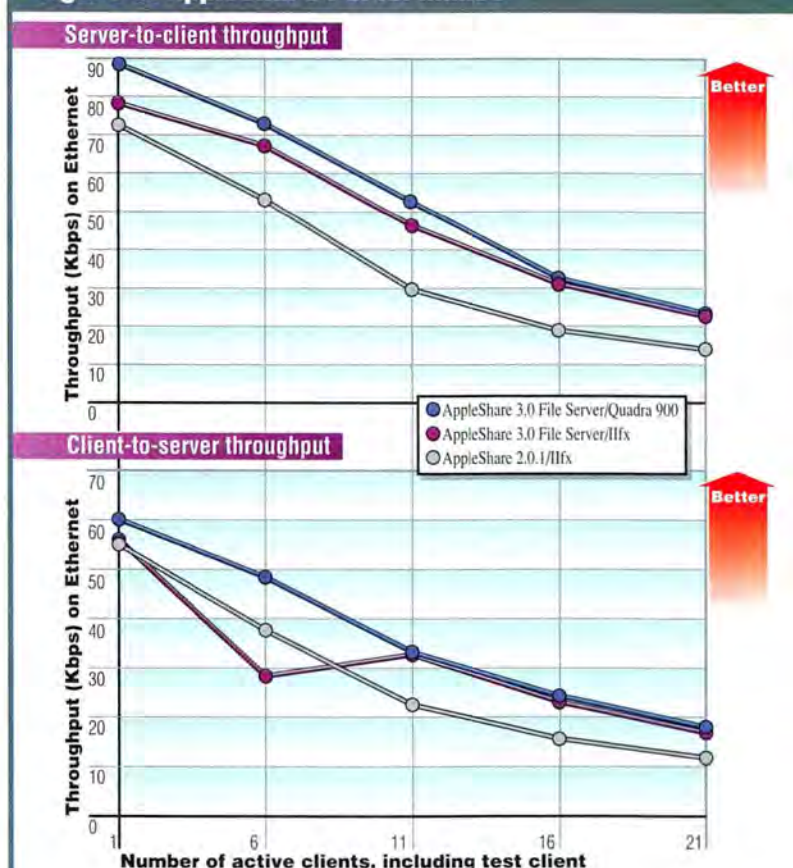


Figure 5: We connected 21 client Macs running System 7.0.1 to three server set-ups. On the server end, the three configurations were AppleShare File Server 2.0.1 on a Mac IIx under System 6.0.7 (AppleShare File Server 2.0.1 will not run under System 7) and AppleShare 3.0 File Server under System 7.0.1 on both a IIx and a Quadra 900. Each client Mac and the IIx server used an Asanté 10BASE-T Ethernet card; the Quadra 900 was connected through its built-in Ethernet port. Clients were connected to the servers via an NRC MultiGate Intelligent 10BASE-T Hub. The hard drive we used on each server was a Wren Elite-1.

An increasing number of clients — first 5, then 10, then 15, then 20 — ran a script

that instructed them every ten seconds to write a file to the server and then delete it, which created a background load on the server. We then copied a folder containing two 512K files from an additional test client to the server and copied a folder of the same size from the server to the test client.

Overall, AppleShare 3.0 File Server performed slightly faster than AppleShare File Server 2.0.1. The Quadra 900 didn't significantly outperform the Mac IIx, however. On file reads (server-to-client) and file writes (client-to-server), AppleShare 3.0 File Server outperformed AppleShare File Server 2.0.1 by only a slight margin. Surprisingly, when running AppleShare 3.0 File Server, the Mac IIx kept up with the Quadra 900 at loads of as many as 21 users.

Users & Groups data file will be replaced with AppleShare 3.0 File Server's data file. System 7 file sharing will be disabled, and you'll need to use AppleShare 3.0 File Server's administration tools, rather than System

7 file-sharing control panels, to monitor and manage your shared data.

Restricting Access. Although AppleShare 3.0 File Server allows 120 users to be logged on to a server concurrently (AppleShare 2.0.1 allowed

only 50, and System 7's file sharing has a maximum of 10), the network administrator can set this number lower to optimize performance.

Password protection in 3.0 also has more options than it did in 2.0.1. The administrator can set a minimum password length, can require users to change their password either the first time they log on or after a certain number of days, and can set a maximum allowable number of incorrect-password attempts (see Figure 4). An AppleShare Server 3.0 network administrator can disconnect one user without disrupting other users' server connections. It's also possible to lock individual files and folders, copy-protect files, and limit the number of users who can concurrently run an application.

User Messages. AppleShare 2.0.1 provided only one type of message: It warned users when a file server was about to shut down or, in extreme and unlucky cases, when it had already shut down. AppleShare Server 3.0 lets administrators send other types of messages. They can, for example, create a log-on message for all users to see when they log on to the server, and they can send messages to individual users or groups of users at any time. (Users must have AppleShare 3.0 workstation software installed on their machines to take advantage of this messaging capability.)

Although messaging is a useful feature, it does have one drawback: If your Mac automatically logs on to a server when you boot the Mac and the administrator has established a log-on message, your startup sequence will stop until you've clicked on the OK button when the log-on message appears. If you've gone out for a cup of coffee, expecting your Mac to have loaded all your extensions and be ready for use when you return, you'll be disappointed. Either Apple or some hacker should eliminate this irritant.

Getting into Print

There is nothing exciting about AppleShare 3.0 Print Server. It has the same features and operates in much

the same way as its predecessor — except that version 3.0 runs under System 7. It also fixes a few bugs that plagued the earlier version.

AppleShare 3.0 Print Server can *capture* — spool jobs from — up to five printers. If you upgrade from AppleShare Print Server 2.0.1 to AppleShare 3.0 Print Server, the new server will maintain the same list of captured printers that you had set up in 2.0.1.

A note of caution: Network managers need to make sure that all users upgrade to version 7.0 or later of the LaserWriter driver, the one that comes with System 7. Even users who are still running System 6 must do so to use AppleShare 3.0 Print Server.

With previous versions of AppleShare, File Server and Print Server software were sold separately. AppleShare File Server 2.0.1 cost \$799, and AppleShare Print Server 2.0.1 sold for \$299. AppleShare Server 3.0 combines the two applications into a single package that retails for \$1,199. Apple also has a generous upgrade discount: The 3.0 package costs only \$199 if you own both File and Print Servers 2.0.1; it's \$299 if you own only the File Server software.

But How Fast Is It?

Features are nice, but even the fanciest file server is unacceptable if it grinds to a halt on a heavily used network. To test AppleShare 3.0 File Server's performance, we installed it on a Quadra 900. We also installed it and AppleShare File Server 2.0.1 on a Mac IIx. (We couldn't install AppleShare File Server 2.0.1 on the Quadra, because it doesn't run under System 7, which the Quadra 900 requires to operate.)

Because an AppleShare file server is most commonly used as a repository for files that are shared by a workgroup, our performance tests focused on reading files from and writing them to the server. We connected 20 client Macs to each server and kept them logged on to the tested server at all times. An increasing number of clients — first 5, then 10, then 15, then 20 — ran a custom script that instructed the clients every ten seconds to write a file to the server and then delete it, which created a background load on the server. With this background load running, a technician at an additional client node (the test client) copied a folder containing two 512K files from the test client to the server and then copied a


The Bottom Line

Apple's newest version, **AppleShare Server 3.0** (\$1,199), of its time-tested server software equals or exceeds the performance of its predecessor, AppleShare File Server 2.0.1. Considering its wealth of new features, including the ability — the requirement, really — to run under System 7 and support for as many as 120 concurrent users, we highly recommend the new AppleShare to Mac users who are looking for a powerful, easy-to-maintain file and print server. At \$1,199, it's a good buy. If you already own version 2.0.1, the inexpensive upgrade is a real steal.

Don't rush out to buy a Quadra to run it on, though. Our tests showed that a Quadra 900 doesn't significantly outpace a IIx as a file server running AppleShare 3.0 File Server. Unless you're a network manager who's running a server on a large network with a very heavy load, you probably won't need the extra power. Put your money into an ultrafast hard drive instead.

folder of the same size from the server to the test client.

Although AppleShare 3.0 File Server performed slightly faster than AppleShare File Server 2.0.1, the Quadra 900 didn't significantly outperform the Mac IIx — at the load levels we tested (see Figure 5). When the test client read a file from the server, the Quadra outpaced the IIx with smaller client loads, but the two converged at greater loads. When the test client wrote to the server — except for an anomaly when a total of six clients were writing simultaneously — the Quadra 900 and IIx ran essentially neck and neck.

Apple has run similar tests on AppleShare 3.0 File Server, with similar results. Its tests, which included greater client loads, found that the Quadra 900 could sustain its throughput rate, even with 90 clients, but that the IIx's performance dropped gradually. In a forthcoming server face-off, we plan to put Apple's claims to the test. Stay tuned for the results. 

Henry Bortman, *MacUser's* technical director, believes that sharing is a virtue.

Table 1: Features



AppleShare Server 3.0

++++%

List price	\$1,199
Upgrade price	Upgrade from AppleShare File Server 2.0.1 and AppleShare Print Server 2.0.1, \$199; upgrade from AppleShare File Server 2.0.1 alone, \$299
Pros	Expanded features include the ability to run multiple applications simultaneously, versatile volume- and folder-mounting options, enhanced password protection, and improved access-privilege management.
Cons	No significant increase in speed over previous version. Doesn't run under System 6.
Company	Apple Computer, Inc. 20525 Mariani Ave. Cupertino, CA 95014 (408) 996-1010

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KaleidoKubes

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ENT0505**

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JAG

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**Publisher: Ray Dream
GRA0291**

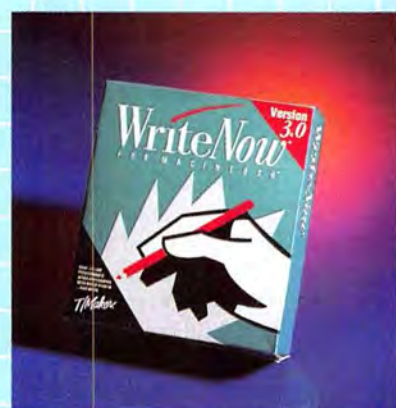
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WristSaverMousePad ACC0635 \$15.
WristSaver ACC0560 \$15.
Bundle BND0033
(Available in Gray, Black, Red or Navy)**

\$25



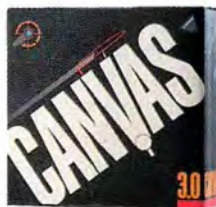
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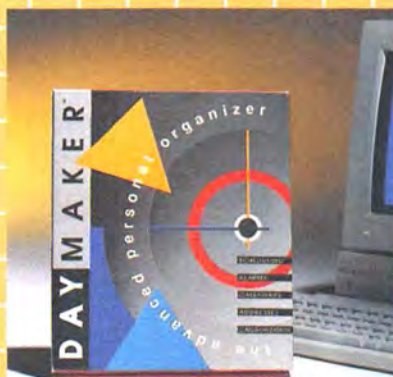
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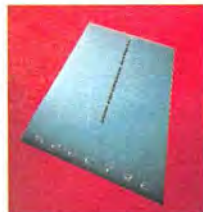


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Manufacturer: Hayes COM0095

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TouchBASE 2.0

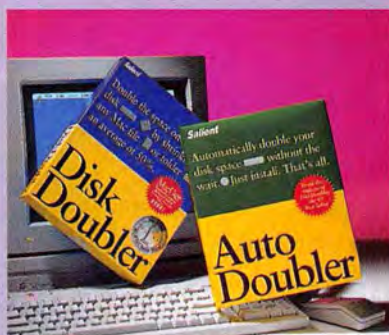
TouchBASE 2.0 contains over 20 new features. Stores information about personal and business contacts and automatically capitalizes words and formats phone numbers. TouchBASE has fields for storing alternative phone numbers, and you can customize the fields. It searches through a single field, or combination, using convenient functions such as "Starts With," "Exact Match" and "Contains," plus "And" and "Or" functions. It prints envelopes and mailing labels, including postal bar codes. Dials the phone, exchanges data with other applications, and shares data over a network. **Publisher: After Hours Software DAT0076**

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DiskDoubler 3.7

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\$49



FileGuard 2.7

"It's sleek, fast, and safe. I highly recommend it." MacUser April 1991. Protect your Hard Drives and Partitions from unauthorized access (including security bypass with a system diskette), copying and erasure; Applications and File/Folders (including system folder) from unauthorized access, deletion, and/or illegal copying; Desktop (including system folder) from alterations by unauthorized user; Keep an eye on System Usage with the system users log which continuously tracks user/group activity. System 7 compatible. **Publisher: ASD Software Office 5-Pack UT10130 \$189. Office 10-Pack UT10131 \$799. Single UT10135**

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DRI0185	Virtual 2.0 PMMU	188.
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PowerCache 40 MHz w/882		1199.
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PowerCache 50 MHz w/882		1799.
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DRI0416	RAM PowerCard	499.
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Alsys		
UT01232	SuperDisk! 1.7	49
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UT01131	FileGuard 2.7 - Office Pack 10	799
Baseline Publishing		
UT01183	ScreenShot 1.2	34
Berkeley System Design		
UT01119	After Dark 2.0	29
UT01231	More After Dark/After Dark 2.0 Bundle	45
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UT01188	Quickies 2 v.2.1	94
Connectix		
UT01148	HAND-Off II 2.2.1	56
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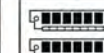
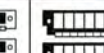


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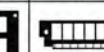


* (Ask for item #CHP0012 1MB 120ns.....\$49.)

	STANDARD	FOR 2MB	FOR 2.5MB	FOR 4MB
 MACINTOSH CLASSIC	 1MB SURFACE MOUNT	 ADD A 1MB EXPANSION CARD	 ADD A 1MB CARD & 2-256K SIMMS	 ADD A 1MB CARD & 2-256K SIMMS OR ADD A 3MB EXPANSION CARD



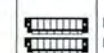

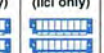











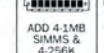




The Mac Classic comes with a standard 1MB of memory, which is surface mounted (soldered) to the motherboard. Additional memory for your Mac Classic is provided by an Expansion Board, which slides into a slot on the Classic's motherboard. The Expansion Board can be purchased with 1MB of memory (for a total of 2MB), and then two 1MB SIMMs can be added to the Expansion Board later, for a total of 4MB. Or, you can install a 3MB Expansion Board, which brings your Mac Classic up to its full 4MB. **CHP0050 1MB Expansion Board.....\$79** **CHP0051 3MB Expansion Board.....\$179.**

	STANDARD	FOR 2MB	FOR 2.5MB	FOR 4MB
 MACINTOSH PLUS & SE	 4-256K SIMMS	 ADD 2-1MB SIMMS	 ADD 2-1MB SIMMS & 2-256K SIMMS	 ADD 4-1MB SIMMS






The Mac Plus and Mac SE have four available slots on the motherboard, which originally contain four 256K SIMMS modules — totalling 1 megabyte (1MB) of memory. To upgrade, you can replace each 256K module with a 1MB module, but you must do this in pairs. Replace two 256K modules and you will have a total of 2.5MB of memory. (That's the two new 1MB modules plus the original two 256K modules.) Replace all four modules and you'll have 4MB. (You should save the 256K modules for later use if you want to pass your Mac on to someone else.)

	STANDARD	FOR 4MB	FOR 6MB	FOR 10MB
 MACINTOSH LC	 2MB SURFACE MOUNT	 ADD 2-1MB SIMMS	 ADD 2-2MB SIMMS	 ADD 2-4MB SIMMS

The Mac SE/30, II, IIx, IIcx, and IIfx each come with a total of eight slots. The standard configuration has four 256K SIMMS modules, or a total of 1 MB. Here, memory must be upgraded in multiples of four. This allows for expansion from 1MB to 4, 5 or 8MB on the II and IIx, and up to 32MB on the SE/30, IIcx and IIfx, depending on whether you are using 1MB, 2MB or 4MB SIMMS. If you are upgrading a Mac IIfx, you must use SIMMS rated at 80ns or faster.

	STANDARD	FOR 4MB	FOR 5MB	FOR 8MB	FOR 9MB (IIfx only)	FOR 16MB (IIfx only)	FOR 32MB
 MACINTOSH SE/30	 4-256K SIMMS	 ADD 4-1MB SIMMS	 ADD 4-1MB SIMMS & 4-256K SIMMS	 ADD 8-1MB SIMMS	 ADD 4-2MB SIMMS & 4-256K SIMMS	 ADD 8-2MB SIMMS	 ADD 8-4MB SIMMS
 MACINTOSH II, IIx	 4-256K SIMMS	 ADD 4-1MB SIMMS	 ADD 4-1MB SIMMS & 4-256K SIMMS	 ADD 8-1MB SIMMS	 ADD 4-2MB SIMMS & 4-256K SIMMS	 ADD 8-2MB SIMMS	 ADD 8-4MB SIMMS
 MACINTOSH IIfx, IIcx	 4-256K SIMMS	 ADD 4-1MB SIMMS	 ADD 4-1MB SIMMS & 4-256K SIMMS	 ADD 8-1MB SIMMS	 ADD 4-2MB SIMMS & 4-256K SIMMS	 ADD 8-2MB SIMMS	 ADD 8-4MB SIMMS

The Mac IIfx comes with a standard 1MB of memory, which is surface mounted (soldered) to the motherboard. Four slots are available for additional memory, and you must upgrade your Mac IIfx in multiples of four. The Mac IIfx is expandable to 5, 9 or 17MB, depending on whether you are using 1, 2 or 4MB SIMMS, and the SIMMS modules must be rated at 100ns or faster.

	STANDARD	FOR 5MB	FOR 9MB	FOR 17MB
 MACINTOSH IIfx	 1MB SURFACE MOUNT	 ADD 4-1MB SIMMS	 ADD 4-2MB SIMMS	 ADD 4-4MB SIMMS

The Mac LC comes with a standard 2MB of memory, surface mounted (soldered) to the motherboard, with two slots available for additional memory. The Mac LC can be upgraded to 4, 6, or 10 MB, depending on whether you are installing 1, 2 or 4MB SIMMS.

CHP0012	1MB SIMMS - 120ns	\$49
CHP0013	1MB SIMMS - 100ns	\$55
CHP0022	1MB SIMMS - 80ns	\$59
CHP0008	1MB SIMMS - 70ns	\$69
CHP0042	2MB SIMMS - 80ns	\$109
CHP0011	4MB SIMMS - 80ns	\$199

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ColorStudio and ImageStudio are the latest Letraset products to take a walk. As of February 15, Fractal Design ([408] 655-8800) — the original developer of both programs and of the Eddy Award-winning Painter — has acquired North American rights to these two products. (Letraset will continue to market them in Europe.) Fractal has lowered the price of ColorStudio to \$795 and hints that a Windows version may be on the horizon.

By Aileen Abernathy

R.I.P.: The shakeout in the page-layout market continues, with Ventura Publisher the latest apparent victim. Ventura Software has laid off the entire Mac development team, part of an overall cut of 2,500 people by parent company Xerox. The year-old Mac product has sold abysmally, and version 3.2 (the System 7 upgrade) could be the last. Work has also been halted on other platforms (GEM, OS/2, and UNIX), as Ventura places all of its eggs — and the company's future — in the Windows basket. ➤ **Also say goodbye** to DesignStudio — the name, not the product. Manhattan Graphics ([800] 572-6533) has introduced Ready,Set,Go! 5.0, which is basically a renamed DesignStudio with support for QuickDraw printers, full compatibility with TrueType and System 7, and new documentation. The RSG 5.0 package, which includes the Separator annex and ReadyScript (formerly DesignScript), has an attractive price, \$395. Upgrade costs range from \$29.95 for DesignStudio 2.0 owners to \$89.95 for RSG 1.0 pioneers. (This offer is available only to U.S. users; former owner Letraset retains marketing rights in Canada and Europe.)



Oneupmanship: 1991 Eddy Award winner FontStudio 2.0 may have taken some wind out of Fontographer's sales, but Altsys ([214] 680-2060) appears to thrive on competition. Its version 3.5 upgrade to Fontographer adds a host of impressive features to the venerable font-creation program: font interpolation, free-hand-drawing and calligraphy tools (with support for Wacom's and Kurta's pressure-sensitive digitizing tablets), a Change Weight feature, a hinting editor, and the ability to generate Multiple Master fonts. \$495; upgrade, \$40. ➤ **Altsys** has also released version 2.0 of EPS



Exchange, its add-on utility for FreeHand. The original release exported FreeHand files as fully editable Illustrator images; the new version reverses the flow, enabling FreeHand users to open Illustrator 88 and 3.0 files (left). \$149; upgrade, free.

On display: The *Los Angeles Times* and the *Chicago Tribune* are two of the many newspapers that use Multi-Ad Creator to produce display ads on the Mac. This slick single-page layout program has graphics features and color-separation capabilities superior to those of some mainstream layout programs. It's relatively easy to use — instant starbursts, anyone? — and provides numerous text effects, borders, and other design elements. Give it the ad elements, and Multi-Ad Creator will even generate suggested layouts for you. In version 3.0, publisher Multi-Ad Services ([309] 692-1530) adds niceties such as object-level trapping, Pantone colors, TIFF masking, and EPS and DCS output. \$895. Ⓜ



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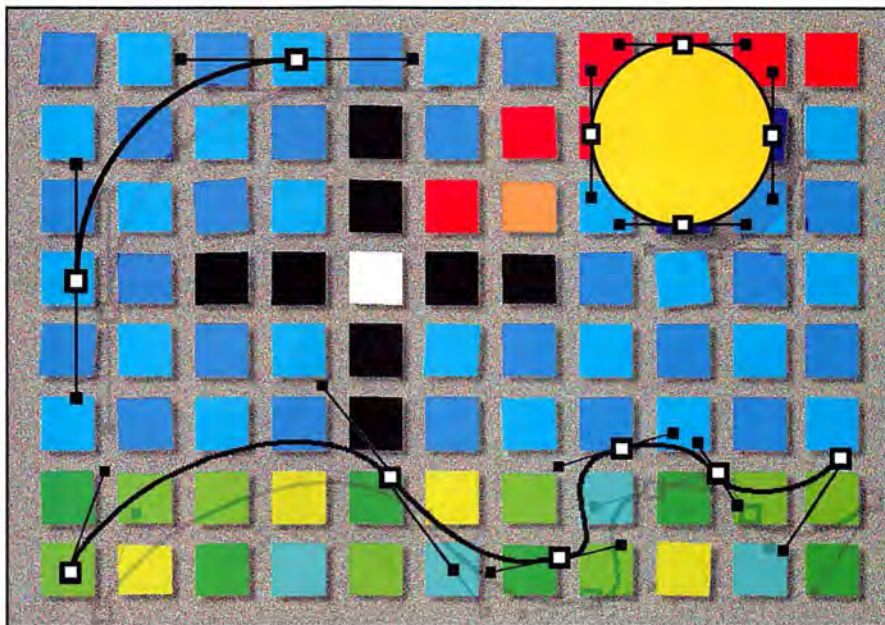
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Graphics Glossary

Confused by the alphabet soup of graphics file formats? This guide spells out the differences and shows you how to distinguish between bit-mapped and object-oriented graphics.

By Salvatore Parascandolo and Aileen Abernathy



In the good old days of Mac graphics (say, 1984), life was simple. There were two programs — one for drawing (MacDraw) and one for painting (MacPaint). Each was black-and-white only, and each had a single file format associated with it — Paint for you-know-what and PICT for MacDraw. Then color came to the Mac, along with scanned images; PostScript illustrations; and most recently, animation. Each advance brought with it a new genre of applications as well as the need for new file formats to store and transport the increasingly sophisticated images.

Today, the Mac's graphics formats have an alphabet soup of names such as TIFF, EPS, PICS, and DCS. Many of these formats have subdivisions of their own — plain old PICT has a colorful sibling, PICT2, and the increasing prevalence of 24-bit color has spawned 24-bit PICT2, color TIFF, and binary EPS. As if that weren't enough, many programs also have proprietary formats that are rarely recognized by other applications.

To make sense of the *mélange* of Mac graphics, you must first understand the difference between a file format — such as PICT and EPS — and the types of graphics — bit-mapped and object-oriented — that applications can produce. A *file format* is the structure of the data used to record an image onto a disk. The same data structure can be used to record more than one type of graphic, and a given type of

graphic can be stored in several data structures. For instance, the PICT file format can contain both bit-mapped and object-oriented graphics, and a bit-mapped image can be stored in a Paint, PICT, TIFF, or EPS format. Each combination of file format and graphic type has advantages and trade-offs.

Bit-Mapped Images

One of the two basic types of graphics is the *bit map*. Its real-world analog is a painting or, more appropriately, a mosaic made from tiny colored tiles. In a bit-mapped image, the tiles are called picture elements, or *pixels*. Lines are depicted as rows of adjoining pixels, and all shapes are outlined and filled with pixels (see Figure 1). As in a real mosaic, you make changes to a bit-mapped image by replacing tiles of one color with tiles of another. You can achieve the illusion of unavailable colors or grays by *dithering*, or mixing, tiles of the available colors or gray shades.

Black-and-white bit maps need only 1 data bit to describe each pixel. Gray-scale and color images created by painting programs (such as PixelPaint, Studio/8, and SuperPaint) or by image-editing applications (such as ColorStudio, Digital Darkroom, and Photoshop) look and act essentially like bit maps. However, a single data bit per pixel doesn't provide enough information to specify a particular color or shade of gray. Images containing 256 grays or

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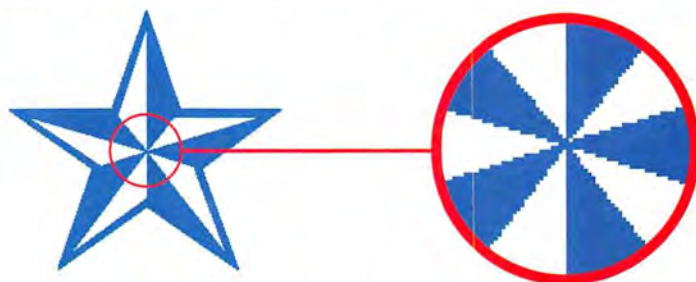
colors require 8 bits per pixel, and photographic-quality, full-color images require as many as 24 bits per pixel to specify 1 of 16.8 million values. Thus, depending partly on their resolution, color and gray-scale files can occupy a vast amount of disk space.

The mosaic nature of a bit map can produce undesirable results when an area of the image is moved, enlarged, or rotated. To move part of a bit map, you must literally rip tiles from the surface and put

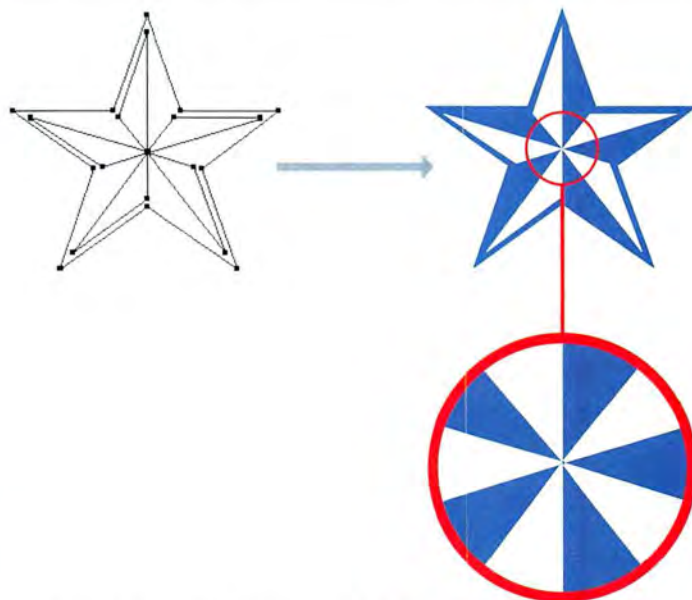
them somewhere else, leaving a hole (no tiles) behind. Wherever you move the image segment, it replaces the tiles that were there, permanently erasing the overlaid portion.

If you enlarge a bit-mapped graphic, it will look as though you've replaced the small mosaic tiles that originally formed the image with larger tiles, and the result will have a blocky and jagged appearance. If you shrink the bit map in a painting or image-editing program, its component

Figure 1: Bit Maps Versus Objects



Bit-mapped graphic: This TIFF image is a mosaic of individual pixels in fixed locations. If it's enlarged, the pixels will seem to grow and accentuate the jaggedness. When printed, the image retains its jagged appearance, regardless of the printer's resolution.



Object-oriented graphic: This EPS illustration is composed of mathematically described paths and drawing instructions (left). Its components can be rendered smoothly at any size and orientation, and the image prints smoothly at the highest resolution available.

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tiles will remain the same size, but some of them will literally be squeezed out of the picture. Restoring a shrunken image to its original size (not by using the Undo command but by stretching it) doesn't restore the lost tiles. Instead, the remaining tiles grow to fill the larger area and the image becomes jagged and distorted. When you rotate a bit map in a bit-map-based program such as PixelPaint Professional, the tiles that compose the image are rearranged so the image *looks* rotated. Unless it's done in 90-degree steps, however, rotation generally wreaks havoc on the image, producing shattered patterns and crumbly lines.

When you print a bit map, the printer reproduces the image exactly as it is stored, in its tiled form. The effective resolution of the printed image is directly dependent on that of the bit map. Coarse bit maps print coarsely; fine bit maps print finely. A Paint image saved at 72 dpi (dots — or pixels — per inch) will be very rough around the edges, compared with a 300-dpi Photoshop graphic. A given Paint image looks the same no matter what it's printed on, a laser printer or an imagesetter.

Although bit maps have inherent limitations, they're still the perfect medium for many needs. When you work with pixels, you can achieve artistic effects that resemble those of traditional painting. Photo-retouching programs perform their magic on bit maps, which are the default graphic type for scanned images.

Object-Oriented Art

Object-oriented graphics — typically produced by drawing programs such as Canvas, MacDraw, and Illustrator — avoid the limitations of bit maps in several ways. First and foremost, the images are composed of mathematically described objects and paths, sometimes called *vectors* (see Figure 1). Object-oriented applications don't store your strokes as a collection of tiles on a surface but rather as a list of drawing instructions compiled from your menu choices and mouse movements. Everything you draw, move, or change updates an internal database that lets the program keep precise track of each item on the drawing surface.

You can enlarge, reduce, rotate, reshape, and refill objects, and the program redraws them with no loss of quality. Moreover, objects can be managed individually as if each item were drawn on a separate, transparent sheet. They can be freely moved over a document's surface

and can be stacked and partially hidden by other objects without being permanently erased.

The advantages of object-oriented art extend to the printing phase as well. Instead of dictating to the printer where each image spot should be, the program mathematically describes the shape of the object and lets the printer render the image at the highest resolution possible. Thus, unlike bit-mapped images, object-oriented graphics are *resolution-independent*. An object-oriented image printed on a 2,540-dpi imagesetter looks far superior to the same image printed on a 300-dpi laser printer.

Object-oriented graphics are excellent choices for technical illustrations, especially highly detailed work, in which any item may be subject to changes in color, shape, position, or orientation. Object-oriented images are also good choices when the size of the finished work is unknown or variable, because they scale, rotate, and print without unpleasant side effects.

Now that we've distinguished the two basic types of Mac graphics, let's look at the various file formats in which they can be stored.

Paint

Simple Bit Maps


Named after its first graphics program, the Mac's most basic format holds only black-and-white bit maps, at 72 dpi. Moreover, the Paint format (file type PNTG) also limits document dimensions to exactly 8 x 10 inches in a vertical orientation.

MacPaint, of course, saves in this format, but other applications — Canvas, DeskPaint, PixelPaint, and SuperPaint, to name a few — can optionally save their images as Paint files. Graphics saved in Paint format are stripped of most attributes, including high resolution, object-oriented flexibility, gray-scale values, and color. And if the original graphic is wider than 8 inches, its right side is lopped off.


PICT

Limited-Color Bit Maps and Objects

PICT (not an acronym) is the oldest generic file format on the Mac. It can hold any mixture of bit maps and resolution-independent objects, which are encoded in QuickDraw, the Mac's native graphics language. PICT objects and bit maps can be any of eight colors: white, black, cyan, magenta, yellow, red, green, or blue. The



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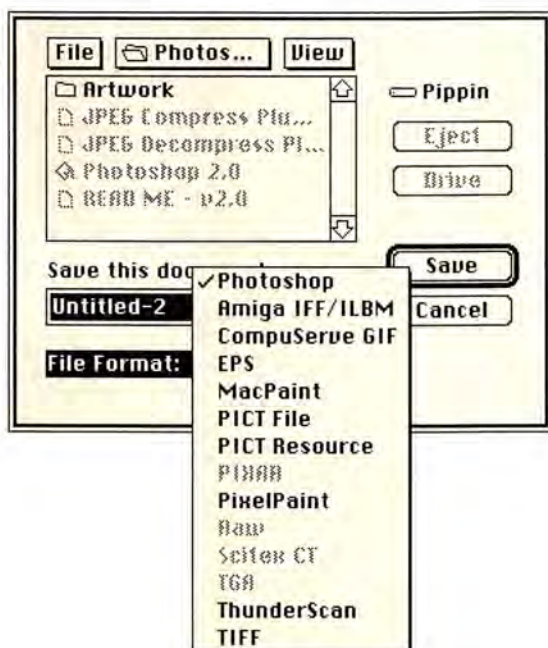


Figure 2: Photoshop can import and export graphics in 14 file formats. This flexibility can be very handy if you need to convert a graphic from one file format to another — for example, if you want to convert a CompuServe GIF file into PICT format so that you can use it in Microsoft Word.

PICT format can hold bit maps with resolutions greater than 72 dpi, but some applications may not support higher resolutions, so they convert high-resolution bit maps back to 72 dpi. The PICT format also allows applications to add comments about image components to the file data. The comments add important details such as curve-smoothing information or PostScript descriptions of the PICT image. If an importing application can't interpret the comments, they will be ignored and therefore not implemented.

PICT is suitable for medium-quality line art and low-resolution bit maps (which can reside in the same file) with a very limited color range. But there's no way to tell whether a PICT file contains bit maps, objects, or both until you open it. When graphics are cut or copied to the Clipboard for pasting into another application, they are normally converted to PICT format.

PICT2

Full-Color Bit Maps and Objects

PICT2, an extension of the PICT format, has two subtypes: a 16.8-million-color version, commonly called *24-bit PICT2*, and the more prevalent *8-bit PICT2*, which holds only 256 colors. Like PICT, the PICT2 format sets no limit on the resolution of bit maps except that imposed by the creating application. Several applications, including Studio/8 and SuperPaint, use PICT2 as their default

Save format. Other applications, such as PixelPaint, offer a PICT Save option, but the images are actually saved as PICT2 files.

With 8-bit PICT2, a custom 256-color palette can be saved along with the image data, enabling any PICT2-wise application to re-create the original screen appearance. Unfortunately, some programs don't save the custom palette when exporting an image and some importing applications ignore the custom palette. In these cases, when the image is opened by the new application, its colors will be determined by the current color palette, which can wreak color-shift havoc. Color shifts may also occur when a chunk of 8-bit PICT2 from one document is pasted into another 8-bit PICT2 document. If the two images have different palettes, the pasted piece will change color.

PICT2 is an excellent choice for presentation and animation work in which the final image is viewed on-screen or on a slide. It's not the best format for use in desktop publishing, however, because PICT2 is poorly supported by page-layout programs such as PageMaker and QuarkXPress.

TIFF

Versatile Bit Maps

Tag Image File Format is the most flexible scheme for storing bit-mapped images that have various resolutions,

numbers of grays, and colors. However, it cannot store object-oriented images. TIFF was created specifically for the storage of gray-scale data, and it's the standard format for scanned images such as photographs. It's also the most reliable format for exporting gray-scale and color images to other programs, ensuring that image tones and resolution are faithfully interpreted by the importing application. TIFF has three subtypes, which are distinguished by the number of colors or gray shades they contain:

- *Monochrome TIFF* stores only 1-bit images, but the black and white pixels can be dithered in a variety of patterns to simulate grays quite accurately. On the other hand, dithered patterns limit the degree to which you can edit and scale an image.

- *Gray-scale TIFF* holds 256 grays. It's the best choice for graphics used in page layouts, because most page-design programs can adjust the contrast and brightness of a gray-scale TIFF image.

- *Color TIFF* can hold as many as 16.8 million colors. It's the preferred format for images that will be color-separated.

Because TIFF files can be quite large, many programs now offer schemes for compressing them. Unfortunately, applications may use different names for the same compression formats, thus confusing users, and a few programs save the compressed files in subformats that aren't recognized by other programs. TIFF 4.0 is the most widely recognized compressed format. The newer TIFF 5.0 format offers additional capabilities such as variable compression schemes, but older applications may not recognize the files.

RIFF

Compressed Bit Maps

Raster Image File Format is not a variation of TIFF. Instead, it's a compressed-bit-map format used by ColorStudio, ImageStudio, and Painter (all of which are from the same developer). RIFF is recognized by several other applications such as QuarkXPress, DesignStudio, and Ready,Set,Go! but is not supported by such heavyweights as PageMaker and Photoshop.

GIF

CompuServe Bit Maps

CompuServe created the Graphics Interchange Format to help users minimize file-transfer times when transmitting bit-mapped images to and from the on-line

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service. GIF incorporates LZW compression, but images are limited to 8 bits (256 colors) and specific dimensions (such as 640 x 480 pixels). GIF is being supported by a growing number of Mac and PC graphics applications, such as Photoshop (see Figure 2).

JPEG

Highly Compressed Bit Maps

Purely speaking, Joint Photographic Experts Group isn't a format. It's a sophisticated technique for reducing the amount of data needed to describe a full-color bit map. JPEG compression can reduce 24-bit images to about 1/20 of their original file size. The process selectively discards relatively unimportant image data and then compresses the rest. This slightly degenerative compression is dubbed *lossy*, and the higher the compression setting, the more data is discarded. At compression ratios of up to 20:1, images look visually identical to their originals, revealing differences only on very close inspection; at higher compression ratios, image degradation starts to become obvious.

Applications offering JPEG compression include Kodak's Colorsqueeze, Radius' ImpressIt, and Storm Technology's PicturePress. Each program creates files in a proprietary format, but the programs also make self-decompressing image files or provide a freely distributable decompression utility.

EPS

PostScript Objects and Bit Maps

Encapsulated PostScript is a popular format for storing object-oriented artwork. Although it can also store bit maps, EPS is seldom used for this purpose, because it's not an economical format, in terms of file size, for pixel-based art. The EPS format has two subtypes: *ASCII* (text-based) and *binary* (hexadecimal). There's no way to tell the two apart by looking at a file, but object-oriented programs (such as Illustrator and FreeHand) that have EPS as their default Save option use the ASCII format.

An EPS file in ASCII format usually contains two versions of the graphic. The main image is a resolution-independent PostScript (text) description for printing on a PostScript device. The second, optional image is a low-resolution, bit-mapped PICT preview — sometimes called *placed EPS* — that can be quickly displayed on-screen without PostScript interpretation. This double-image scheme

enables page-layout programs to import, crop, and scale high-quality EPS graphics while using the quick-rendering PICT version to provide feedback to the user. If an EPS file has no embedded PICT version of the graphic, the importing application will display a rectangular placeholder.

If an object-oriented image is saved in EPS format, it will retain its resolution-independent printing quality, but typically when opened — even by the same application that created it — it can't be ungrouped, refilled, or recolored (Illustrator files are an exception). However, the image can be resized, distorted, or cropped. Note that when you slant, resize, or rotate an EPS image, the screen version may become distorted but the image prints perfectly. Unlike bit-mapped files, they're impervious to importation miscues. Moreover, all color-separation programs accept and correctly separate EPS files.

Bit-mapped images can also be saved in EPS format, but each pixel of the bit map will be individually described by CMYK color attributes. Expressed as ASCII text, the descriptions of all those pixels produce huge files. Fortunately, there's a more compact format, binary EPS, for saving color bit maps. Binary EPS is outwardly similar to the ASCII version, containing both a PICT preview image and the actual graphic. The pixels of the printable graphic, however, are stored as a stream of hexadecimal numbers, which express the same information as ASCII text but use only half the disk space. Both Photoshop and ColorStudio can save bit-mapped graphics in binary EPS format.

PostScript

A PostScript file is a purely text-based description of an image, without the displayable PICT image that EPS offers. In many applications (PageMaker, for example), you can create a PostScript file by holding down Command-F while clicking on OK in the Print dialog box. The Print dialog box in version 7.0 of the LaserWriter printer driver has an option for printing files to disk in PostScript format. A PostScript file can be opened with any word processor and modified.

The beauty of pure PostScript is that you don't need the original application to print the file. With a PostScript download utility, the PostScript file can be fed directly to a PostScript printer such as a LaserWriter or high-resolution image-setter. The drawbacks are that there's no preview image and that the graphic loses

its editability. Therefore, always keep the original version of an image in the native format of the creating application.

DCS

Preseparated Color Bit Maps


Desktop Color Separation is not a format, per se; it's a technique developed by Quark for separating color TIFF and PICT images *before* bringing them into a page-layout application. It enables programs that can't internally separate bit-mapped images to incorporate the graphics into their color-separated-page files. Applications that can produce DCS files include ColorStudio, Photoshop, and PrePrint.

A DCS separation consists of five files: four EPS files — one each for the separated cyan, magenta, yellow, and black components of the original image — and a linked PICT "master" file for screen display. You place, crop, and scale the low-resolution PICT image in a DCS-savvy program such as PageMaker, QuarkXPress, or FrameMaker. When you are ready to color-separate the completed layout, the layout application automatically fetches the separation files; applies the positioning, scaling, and cropping information used on the PICT image; and merges each DCS file with the appropriate page plate.

PICS

Animated Bit Maps

A PICS file is essentially a collection of PICT or PICT2 bit-mapped images in sequential order, much like movie frames. It's the storage standard for programs, such as MacroMind Director and SuperCard, that create animations. It's also an output option for 3-D applications — Swivel 3D Professional, StrataVision 3d, and Infini-D, for example — that can animate objects or viewpoints to produce sophisticated action, simulations, and structure walk-throughs.


PICS files can be huge, depending on their color depth, number of frames, and frame size. Some applications economize on file space by compressing a PICS file, but the compression scheme is not standard and the resulting movie may play back only through the application that created it or through a playback program supplied by the same developer. 

Salvatore Parascandolo is product manager for advanced graphics at Silicon Beach Software, an Aldus subsidiary. Senior editor Aileen Abernathy is MacUser's resident expert on desktop publishing.

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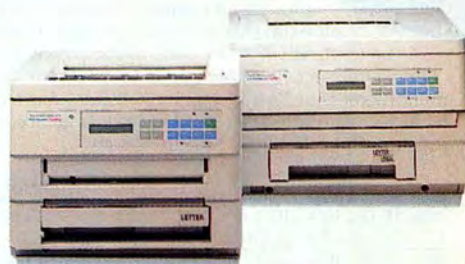
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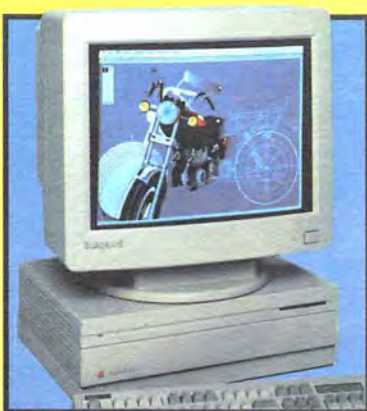
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CIRCLE 198 ON READER SERVICE CARD.

Custom Color Logos

You can create eye-catching display type by converting font characters into editable graphics and adding special effects such as blends.

By Janet Ashford

The brightly colored labels that once adorned boxes of California produce are now collector's items. The logos featured colorful lettering in bold styles as well as illustrations of fruits and vegetables. Some modern agricultural firms are keeping this graphic tradition alive, however. Fresno-based designer Charles Shields uses Adobe Illustrator 3.0 to reproduce the clean, air-brushed look of the original labels. (Similar effects can be created in FreeHand, LetraStudio, TypeStyler, or Canvas.)

Recently Shields created a 1940s-style logo for a producer of dates. He scanned lettering from an old type book and created a PostScript Type 1 font with Fontographer. He then typed the appropriate letters in Illustrator, converted them to editable objects, and filled the outlines with a custom three-part gradation. Using Adobe Streamline 2.0, Shields auto-traced a script-style font and a drawing of date palms. Taking advantage of Streamline's ability to automatically assign colors to black and white areas of an image, he made the tree silhouettes black and the surrounding open areas gold.

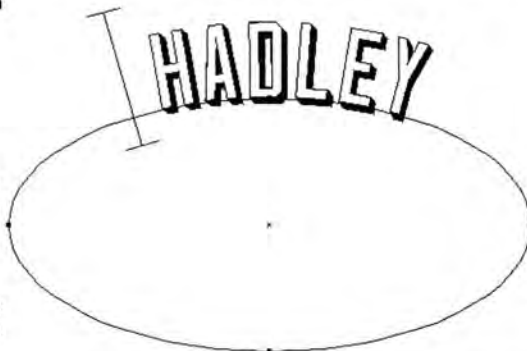
Graphic designer Janet Ashford coauthored *The Verbum Book of PostScript Illustration*.



Using Illustrator 3.0 and Streamline 2.0, designer Charles Shields created a traditional-looking logo for Hadley dates.

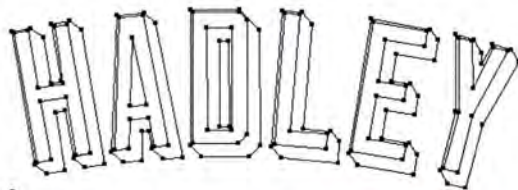
1 Setting Type on a Path

Shields finds Victory, a typeface with a 3-D look, in a book of copyright-free typefaces. The characters are scanned and converted into a PostScript Type 1 font with Fontographer 3.3, a font-creation program. (An existing font from a type vendor could also have been used.) After the printer and screen fonts have been installed, Shields types the letters for *HADLEY* in Illustrator 3.0, using the path-type tool to set them along the top curve of an ellipse.

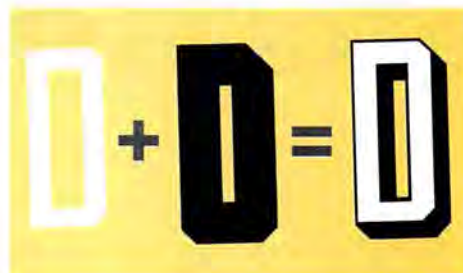


2 Converting Text to Graphics

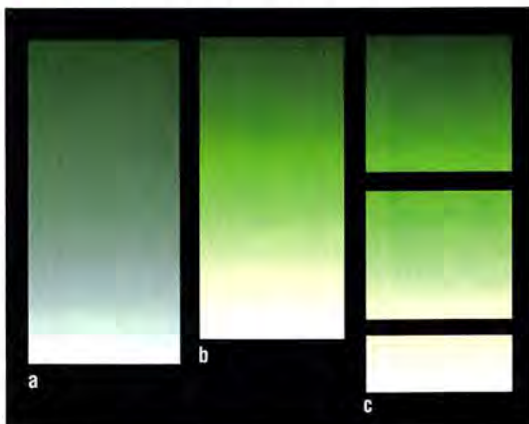
In order to add a blend to the text, the font characters must be converted to graphics. The text is selected, and the ellipse's center point is deleted (to avoid an error message). The Create Outlines command then converts the text to PostScript objects, complete with Bézier points (a). (The shapes that define the "counters" [holes] in the *A* and *D* are automatically linked to the outer shapes as compound paths so that the counters remain transparent when the letterforms are filled.) The letter faces are now white-filled objects sitting on top of the black-filled letter sides. The left edge of each letter side extends slightly beyond the left side of the corresponding letter face so that it appears as a black outline (b).



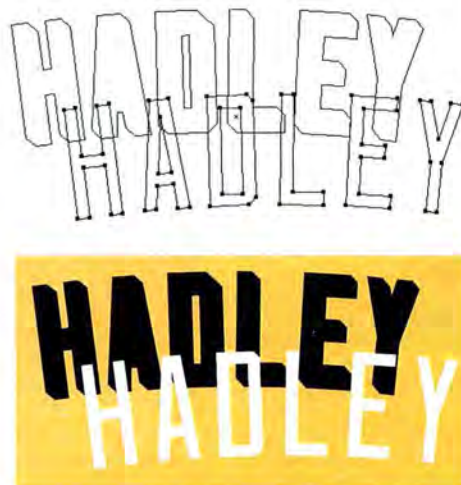
a



b

3 Creating a Three-Part Blend

In Illustrator, producing blends involves creating a gradation between two colored objects. A single blend can move between only two colors — for example, between dark green and white (a). But Shields plans to fill the *HADLEY* letter faces with a four-color gradation, so he constructs a special three-part blend. A thin, dark-green rectangle is blended to a yellow-green rectangle directly below it. In turn, the yellow-green rectangle is blended to a yellow rectangle below it. Finally, the yellow rectangle is blended to a white rectangle. The result looks like a single multicolored blend (b). If the sections are separated, however, you can see three distinct two-color blends (c).

4 Regrouping Font Outlines

Shields wants to fill the *HADLEY* letter faces with the four-color gradation and a yellow stroke but leave the letter sides black. To do this, he must split the character outlines into letter faces and letter sides. The outlines are selected as a group and separated into their component shapes with the Release Compound command. Shields then recompounds the faces of the letters *A* and *D* by selecting the outlines and counters and using the Make Compound command.

5 Masking Blends into Letters

For each letter of *HADLEY*, the three-part blend is copied and rotated by eye over the letter shapes so that the direction of the blend and its corresponding letter are aligned. The letter face is then selected and styled with a yellow stroke and no fill. Shields defines the shape as a masking object by checking Mask in the Paint Style dialog box. Using the Send to Back command ensures that the masking object (the letter face) is behind the object to be masked (the blend). Finally, each letter and its blend are grouped, which activates the mask and makes the blend visible only inside the shape of the letter. Because the extraneous areas of the blend are hidden by the mask, the black letter sides are clearly visible.

6 Creating Script Lettering

Shields creates the words *Date Gardens* by scanning an old font called Coronet Bold and using Streamline 2.0 to auto-trace the scan. The Streamline outlines are opened in Illustrator, where unwanted letters of the alphabet are deleted. The appropriate letters are arranged so that they flow together like cursive handwriting.

7 Making Outlined Text

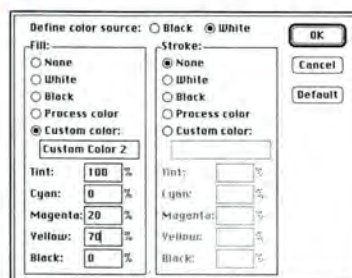
a *Date Gardens*

b *Date Gardens*

c *Date Gardens*

The *Date Gardens* letterforms are styled with a 5.5-point black stroke and fill (a). Then the Copy and Paste in Front commands are used to position a copy directly over the original. The copy is given a 2.5-point white stroke and fill, which leaves part of the original shape showing from behind as a black outline (b). Another copy is created, placed directly on top, and given a red fill and no stroke. The final effect has red letters that flow together, surrounded by a double outline of white and black (c).

8 Producing Palm Trees



a



b



c

Palm-tree outlines are drawn with a felt-tip pen; scanned; and opened in DeskPaint, where the tree silhouettes are filled with black. The image is saved as a PICT file, opened in Streamline 2.0, and auto-traced in Outline Mode. Streamline's Tint & Color dialog box is used to change the style of white areas to a gold fill with no stroke (a). When the EPS image is opened in Illustrator, this custom style is automatically applied to the graphic (b). A circle is drawn and positioned behind the palm-trees image and filled with the same gold color (c).

9 Finishing the Design

The completed palm-tree art is positioned to the left of the lettering. A copy is flipped and placed on the right, and a blue ellipse is placed behind the lettering. A line of type in Copperplate is set on a curve along the bottom of the ellipse. Shields adds black and white outlines to the circles and ellipse, using the technique described in Figure 7.

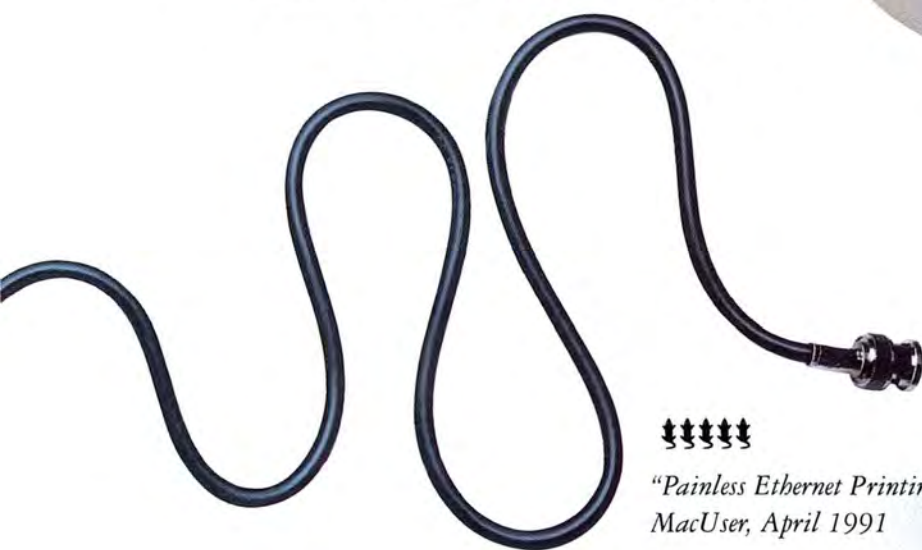


10 Creating More Logos



Shields used similar type-creation techniques to produce logos for several other agricultural firms. This label for First Place fruit uses the Victory font originally created for Hadley dates.

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"Painless Ethernet Printing"
MacUser, April 1991



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CIRCLE 133 ON READER SERVICE CARD.

Got a big network? Tired of scrolling through endless lists in the Chooser? Check out Silver Cloud, from AG Group ([510] 937-7900). This Chooser replacement lets network administrators configure customized "pseudo-zones" that display in a single dialog box any collection of printers, servers, and the like — even though the device icons displayed may be of different types and may physically reside in different zones. Prices start at \$695 for a 50-user pack.

By Henry Bortman

Fast and secure routing:

Compatible Systems has announced the RISC*Router 3000E, a RISC-based Ethernet-to-Ethernet router. Due in spring 1992, for \$2,995, the RISC*Router 3000E will be powered by the MIPS R300A RISC chip and will support the AppleTalk, TCP/IP, and DECnet protocols as well as SNMP-based network management. ♦ Meanwhile, Compatible's Ether*Route and Ether*Route/TCP LocalTalk-to-Ethernet routers now

offer **Enhanced Network Security** (ENS), which lets a network administrator set up password protection to restrict user access to network devices (such as printers) or even to entire zones. Shipping with all new routers; free upgrade available to current router owners.

More restrictions: KeyServer, a management utility from Sassafra ([603] 643-3351), lets you control the number of simultaneous users of an application that resides on a Mac connected to a network. The new 3.0 version lets a server administrator control which users may access an application by restricting its use



to certain user names and requiring a password. It also supports AppleTalk Remote Access. Prices start at \$680 for ten KeyServer users.

Little hubs: Everyone's getting in on the Ethernet 10BASE-T-minihub act. Shiva was first with the 4-port Hublet (\$399). TechWorks now offers a \$449 8-port hub, the HubWorks-8. Dayna's 8-port DaynaSTAR MiniHub is also \$449. Asanté's 10T Hub/8 comes in at \$399. Asanté has also reduced the price of its 12-port 10T Hub/12 by \$200, down to \$799. The "correct" way to compare prices on such items is to compare price per port. Anyone who learned long division — or has a calculator — can do this with relative ease, but just in case: TechWorks' HubWorks-8 and Dayna's DaynaSTAR MiniHub, \$56 per port; Asanté's 10T Hub/8, \$44 per port; Shiva's Hublet, \$100 per port.

Purple haze: Silicon Graphics, maker of the high-powered 3-D graphics workstations used to produce the special effects in *Terminator II* and *Star Trek VI*, recently added three models to its IRIS Indigo line. Offering the same small footprint as the original Indigo, the Indigo Gold, Gold 24, and Express (priced at \$13,500, \$15,500, and \$27,000, respectively) provide increasing degrees of 3-D graphics power. The Gold 24 and Express offer 24-bit color. (415) 960-1980. □





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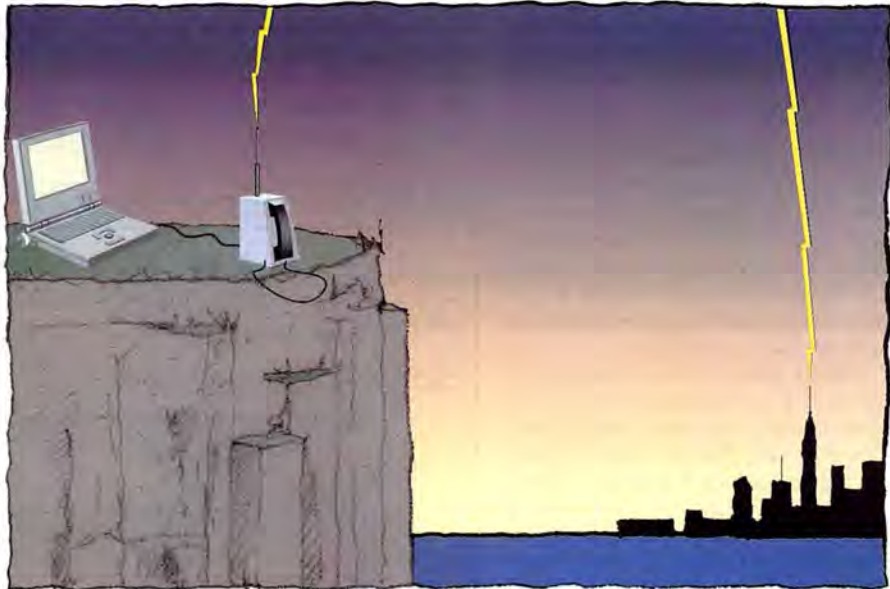
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Dialing for Data

With Apple's release of the PowerBooks, Mac users on the go are looking for ways to dial in to the office.

By Stephan Somogyi



It's inevitable. At some point, you'll leave your office and realize that you left something on your Mac — something you wanted to take with you. If you have a modem connected to your Mac at work and a modem-equipped Mac with you, you can retrieve what you need with one of the remote-access products now available.

Although modem connections are slow, they make it possible and feasible to dial in to your office to gain access to the resources on your company's network. Even if you aren't dialing in to a network, you can use a modem to connect to another stand-alone Mac for screen sharing and file transfer or for dialing in to an E-mail server to send and receive E-mail.

Dialing the Net

The most general and useful form of remote access is dialing in to a network. Any network resource — a printer or a file server, for example — that you would normally access with your networked Mac is equally accessible via a remote connection. There are two approaches to network dial-in on the Mac: peer-to-peer (any Mac can dial any other Mac) and centralized (you have to dial in to a Mac running dial-in software or to a stand-alone hardware device).

Apple's ARA (AppleTalk Remote Access) 1.0, the most recent addition to the Mac dial-in field, is a peer-to-peer solution. The same software is installed on both Macs, and either one can call the other. ARA uses a new protocol,

ARAP (AppleTalk Remote Access Protocol), to transmit AppleTalk data over phone lines efficiently.

ARA requires System 7 and is seamlessly integrated into System 7's user interface. System 7's Users & Groups paradigm lets you control who can access your shared folders. When ARA is installed, you can use the Users & Groups control panel to specify which remote users can dial in to your Mac (see Figure 1).

ARA also provides callback security: When a user dials in, gives the correct password, and is validated, the machine that was called hangs up and calls the originating Mac back. This ensures that no outsider can successfully dial in with only the password. It also makes your base Mac's phone line the one to which the bulk of your phone charges are billed. There is a hitch: You have to set up the callback number before you leave town — and you don't always know what it will be.

The process of dialing in to another Mac via ARA is straightforward. The Remote Access application creates connection documents that contain blanks for a user name, the password, and the phone number being called. The caller fills in the necessary information, and Remote Access sets up the connection. Connection documents can be saved and reused.

Shiva has several stand-alone hardware-based products that allow network dial-in. Shiva's TeleBridge, EtherGate, and Net-Modems let remote users connect to a network

over standard phone lines, using Shiva's dial-in software, which works under either System 6 or 7. They connect directly to a network and allow a remote Mac to access that network directly without having to go through another Mac. They also enable users on the network to dial out and don't require a separate modem for each user.

The TeleBridge enables a standard modem to be used for remote network connections. NetModems — there are three different models — are modems with built-in network capability. The EtherGate is primarily an Ethernet-to-LocalTalk router; when a modem is connected to one of its two serial ports, it supports dial-in connections.

Shiva's dial-in software, common to all of its dial-in products, uses the Network control panel as its user interface (see Figure 2). Once you've entered a phone number and chosen a serial-port speed, the dial-in software connects with the remote device. If a dial-in password has been set up, you are prompted for it when the modems connect. Shiva's hardware supports only a single dial-in password for all users, and callback is not an option.

Farallon's Liaison 3.0 is yet another network dial-in product for the Mac. As with Shiva's packages, Liaison's dial-in capability is only one feature of the product. It is primarily a software router. Liaison runs on the base Mac, the one you dial in to. You use Liaison's dial-in software, Liaisonet, from remote sites. Both Liaison and Liaisonet run under either System 6 or 7.

Liaison allows very flexible configuration of dial-in users' access rights, including callback. But because Liaison is a software router, using it for dial-in means adding a router to your network. Some network managers may not want to do this, because adding a router inevitably adds complexity to a network.

Tapping Network Resources

Once you're connected to your office network, you can access all its services: file servers, mail servers, networked printers, databases — any resource you can normally access from a Mac connected directly to the network.

File Sharing. Via AppleShare client software, you can get at all AppleShare and compatible servers, including shared volumes on System 7 Macs that have file-sharing turned on. You can also access TOPS volumes if you run TOPS software

on both sides of the connection.

You probably don't want to perform any transfers of large files over a dial-up link, though. If you think LocalTalk (230.4 Kbps) is slow, try moving a 500K file across a 2,400-bps connection. If you need to move large files across a dial-in link, you should use compression utilities you can invoke remotely. Products such as Aladdin's SpaceSaver and Salient's

AutoDoubler let you compress files simply by renaming them. Over a remote AppleShare or TOPS connection, this is useful, because all you have to do to compress a file on the disk it resides on before transferring the file is attach a special compression suffix to the filename. If you have screen-sharing software installed, you can control your base Macintosh remotely to compress files with a compression tool

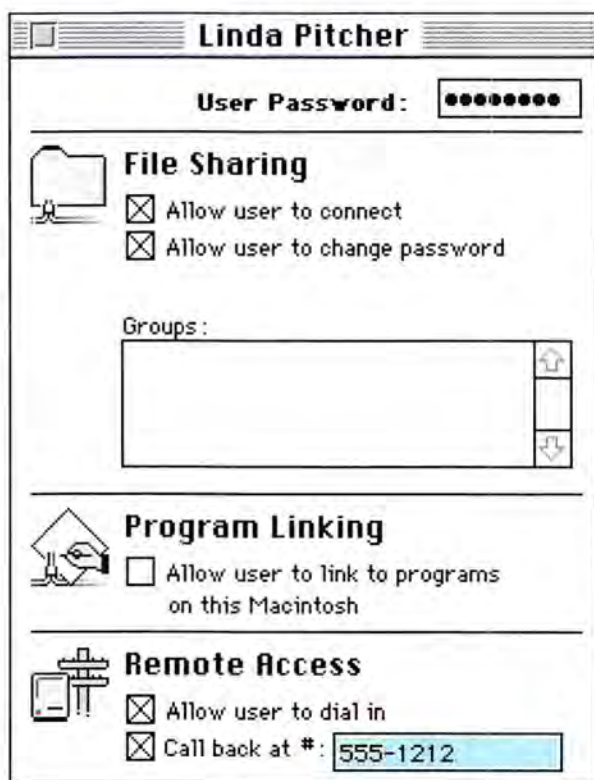


Figure 1: ARA extends System 7's Users & Groups paradigm, enabling users to control remote access to their Macs.

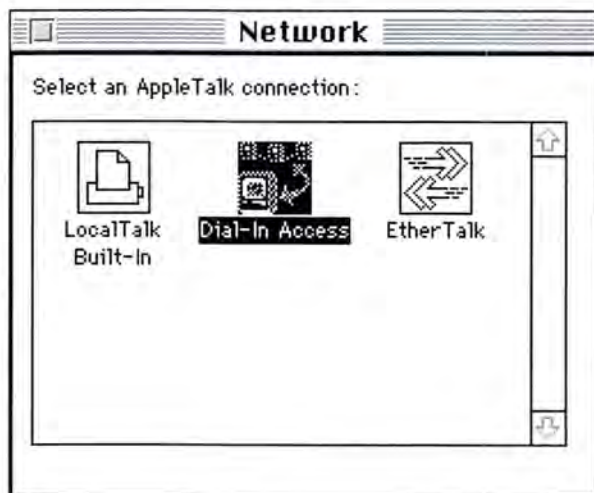
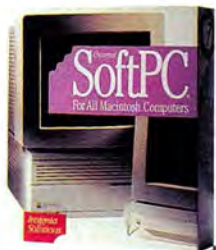


Figure 2: Shiva's Dial-In Access software is activated from the Network control panel. When you connect to a remote network, you're disconnected from your local one.

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such as DiskDoubler or StuffIt before you move it across your dial-in link. In almost all cases, the transmission time you save by compressing the file before the transfer is greater than the time it takes to compress and decompress the file.

Application Launching. In general, dialing in to a network and running an application that resides, say, on a file server is not highly recommended. You'll spend a lot of time watching the clock hands turn as not only your data but also the program code moves over the dial-in link. One thoughtful feature of ARA is that if you inadvertently double-click on an application that resides on the other end of a remote connection, ARA displays a warning dialog box that asks if you really want to launch the program.

Other Services

Although dial-in network connections give you access to resources on a distant network, you sometimes need to connect to another Mac that isn't on a network.

Screen Sharing. Microcom's Carbon

Copy Mac and Farallon's Timbuktu/Remote allow one Mac to control the screen of another over a dial-up connection, regardless of whether the computer is on a network or not. The screen of the Mac you dial in to appears in a window on your screen; you can control it as if you were sitting right in front of it. Although the Mac you dial in to needn't be on a network, if it is, you can access that network's services, using the called Mac as your proxy. There is one difference between dial-up screen sharing and being there in person: Dial-up is much slower (you'll probably want at least a 9,600-bps modem). Carbon Copy Mac and Timbuktu/Remote also provide file-transfer capability that doesn't require the use of AppleShare or TOPS.

Remote Mail. Of all the E-mail packages available for the Mac (see "Stamp of Approval: Mac E-Mail Systems," March '92, page 158), only CE Software's QuickMail offers an application with a full graphical interface for making non-networked dial-in connections directly to

the mail server. (Microsoft Mail provides an ASCII-only terminal-like utility. And you can, of course, use any of the network-based E-mail packages over a network dial-in connection). QuickMail Remote has a user interface that's similar to that of the network version of QuickMail client software. However, it doesn't allow remote creation of address books: You can create address books only while you are connected to a QuickMail server over a network. If you forget to do this before you take off for parts unknown, you may be stuck on the road and have to remember the names of your mail recipients precisely as they appear on your QuickMail server, middle initials and all.

Repelling Invaders

Any phone line that lets users dial in to a network or a Mac has the potential for unauthorized access to network services such as file servers and databases. ARA can be set up to be secure, but because it is an end-user-oriented product, there's no guarantee that users will take advantage of

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its security features. Any users who install it on their Mac are adding potential unauthorized access points.

An individual password can be assigned to each remote user who is allowed to access a specific Mac. But the setting that restricts remote users to accessing only the services available on that Mac (file-shared volumes, for example) and denies them access to the services of the rest of the network (such as AppleShare file servers) is a global setting. If you provide complete network access to any remote user — such as yourself when you're on the road — you risk giving access to anyone who dials in to your machine. If you inadvertently enable guest access to your Mac, you also enable access to all network services, which creates an extremely vulnerable break-in point.

To mitigate this vulnerability, Apple provides a rudimentary form of network security for ARA. It allows a network administrator to establish a special password that all users on the network must enter before they can enable dial-in access

On the Horizon

Shiva and Cayman Systems have given technology demonstrations of dial-in servers, devices that have multiple serial ports for connection to modems. These units will offer similar flexibility in managing user access — setting user names and passwords, for example — as Apple's ARA does, because the dial-in client software for these new boxes will be ARA. The servers will let users off-load the task of managing dial-in network connections from their office Mac, for example, to a stand-alone hardware device.

The next step in the evolution of ARAP (AppleTalk Remote Access Protocol) is also in the works. ARAP 2.0 will use PPP (point-to-point protocol) to move data across remote links. The current version of ARA (1.0) uses an Apple-developed proprietary protocol to maintain the modem connection and transfer data. PPP is a standard protocol used in several different networking environments for dial-in connections. It allows multiple network protocols to run over the same PPP connection, unlike the current ARAP implementation, which supports AppleTalk only. At press time, there was no firm time frame for ARAP 2.0's release.

on their Mac. This password is used for the entire network. To set up this password, however, the network administrator must change the network's router configuration and add a new zone. If your network doesn't have a router or the administrator is disinclined to add a new zone just to support dial-in, Apple's security solution will be inadequate, because a reasonably

bright hacker can easily gain access to privileged information. Several vendors plan to market dial-in servers (see the "On the Horizon" sidebar) with more-robust security.

Shiva's products allow only one dial-in password, which is shared by all remote users. Anyone who discovers that password can dial in to the network, so many

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networks with these products aren't sufficiently secure.

Liaison, of all the current network-dial-in products, provides by far the most-comprehensive security. As with ARA, each dial-in user has a separate user name and password and can have callback enabled. ARA lets users manage their own individual list of authorized dial-in users and passwords; with Liaison all calls must come to one central point, the Mac running Liaison, and the network administrator usually manages the user list.

In addition to network access, the services on a network should also be secure. For example, network administrators should not allow guest access to servers. Many users forget to disable guest access when they turn on file sharing. The same goes for any network service such as a multiuser database: If it can be made more secure, it should be. Although some users decry this approach for being unnecessarily harsh, you should consider the value of the data on the network. If you don't mind that anyone with a modem can access a

particular network service, there's nothing to worry about. If, however, sensitive and critical information is present on your network, it should be protected.


A Word or Two of Advice

Dial-in connections are slow. Although 2,400 bps is usable for E-mail, it's painfully slow for anything else; 9,600 bps is satisfactory for most network services, including screen sharing and modest amounts of file transfer. V.32 modems, which provide 9,600-bps bandwidth, are dropping in price and are rapidly becoming the dial-in standard. If you dial in frequently, an investment in a V.32 modem will pay off quickly.

V.32bis modems, which provide a bandwidth of up to 14,400 bps, are also becoming more affordable but are still much pricier than V.32 modems. However, for telecommuters and those who dial in regularly, this investment will amortize quickly, because of the time savings. After all, V.32bis throughput is 50 percent greater than that of V.32.

Dialing in is now part of the Mac mainstream. Fast modems are fairly inexpensive, and various types of dial-in software are available to meet a broad spectrum of remote-access needs. The main problem left is network-dial-in security, which is inadequate in most products.

Dialing in to a network provides the best overall value, because it allows access to all network services. Point-to-point screen sharing is useful when there is no remote network or the connection must be network-independent. E-mail dial-in provides the most focused feature set and is also the easiest for nontechnical users.

If your network currently has no dial-in capabilities, you should investigate the possibilities. The flexibility of being able to reach network resources remotely will soon make you wonder how you ever did without it. 

Stephan Somogyi, MacUser's network administrator, thinks telecommuting is cool, because it keeps him in closer proximity to his stereo, refrigerator, and local bakeries.



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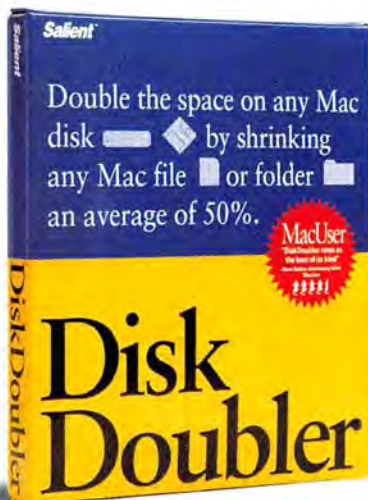
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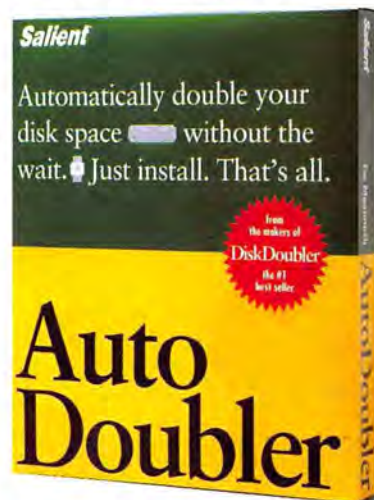
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The File That Wouldn't Print

By doing a little sleuthing, you can often discover the reason why a document won't print.

By Kurt VanderSluis



In the last installment of Trouble Shots ("I Can't Print," March '91, page 199), we were hot on the trail of a printing problem. A client couldn't print a nine-page Word file on a PostScript laser printer (GCC's BLP IIS), because of a PostScript error in the printer. I traced the problem to an incompatibility between the Word document and LaserWriter driver 7.0 and fixed the problem temporarily by having the client print the document with System 6.0.7 and LaserWriter driver 6.02.

But the client needed a solution to this printing miscue so he could return to using System 7 and LaserWriter driver 7.0. This meant I'd have to troubleshoot the problem at a deeper level, getting inside the printing process and finding out exactly what was going wrong so I could solve the problem on a permanent basis.

When I tried to print the Word document and monitored its progress with PrintMonitor, the error message I received from the printer was "Error: stackunderflow; Offending Command: exch." This error had occurred while the printer was trying to turn the PostScript instructions sent by the LaserWriter driver into a printed page. The error message indicates that when the printer interpreted the exch command, it erroneously anticipated that two pieces of data were present in specific locations in its memory but those memory locations were actually empty.

I knew that version 4.00D of Microsoft Word was compatible with System 7 and LaserWriter driver 7.0. The Word file contained several imported graphics, however, so

I suspected that the error might be connected to one (or more) of the embedded images. Because I didn't know which application(s) had produced the graphics, I needed to do a little sleuthing through the PostScript instructions to find out.

One way to monitor the PostScript instructions was to print the file again and use a protocol analyzer such as AG Group's EtherPeek/LocalPeek or Neon Software's Net-Minder to capture the data packets as the LaserWriter driver sent them to the printer. By looking through the PostScript data packets, I could discover where the offending `exch` command was. The disadvantage to this approach — besides the requirement for a protocol analyzer — was that the PostScript instructions would be spread out over many data packets.

My preferred approach is to create a PostScript version of the Word document. A PostScript file is a single, continuous string of ASCII text, which is easy to open in a word processor and comb through for clues—a way around deciphering data packets. The Print dialog box for LaserWriter driver 7.0 has an option for printing files to disk in PostScript format. The resulting PostScript file contains all the PostScript instructions that would normally be sent to the printer, plus a bit more. In a normal print job, for example, the LaserWriter driver determines what fonts the printer has in its memory (or on an attached disk) and downloads only the additional font definitions needed for the document, if any. Because a PostScript file is created without any regard to

BRIDGES TROUBLE SHOTS

the target printer's characteristics, the file contains a definition for every font used in the document.

After creating the PostScript file, I opened it in a word processor and numbered the lines of PostScript code so I'd have a

reference system to help me work through the file. Next, I replaced all the instances of *exch* with *exch*. This changed nothing, of course, but it did reveal that there were 292 instances of the *exch* command, which had caused the stack-underflow error.

Then I got an idea of where the Word document's page breaks were located within the PostScript file by searching for *Page 1*, *Page 2*, and so on.

When the error message occurred, PrintMonitor reported that eight pages of the nine-page document still had to be printed. Because the printer had not produced a page yet, I suspected that the problematic *exch* command was located on page 1 or page 2. Both pages contained several graphics.

I selected all the lines of PostScript code that described page 2 (lines 1210 to 1764) and counted the number of instances of *exch*. There were seven occurrences, all of them in a PostScript definition that followed a comment on line 1237:

```
% P2 Header - Version 2.0-  
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Beach Software, Inc.
```

This comment line provided a vital clue about the program that had created the suspect graphics. Silicon Beach Software (a subsidiary of Aldus) is the developer of SuperPaint, a popular graphics application. This comment line marked the beginning of the PostScript definition for **P2**, in which SuperPaint 2.0 describes how to draw a particular object. All the instances of *exch* occurred between the comment line and the many lines of hexadecimal numbers that began on line 1268. Because rows of hexadecimal numbers indicate a bit-mapped image, it was obvious that lines 1238 through 1267 and the hexadecimal code that followed were the instructions for a SuperPaint graphic that was in the document.

I checked *System 7: Compatibility with Selected Hardware and Software*, a booklet that Apple ships with System 7, and found that SuperPaint 2.0 was listed as mostly compatible and that version 2.0a was listed as fully compatible. (SuperPaint 3.0, now shipping, is also fully compatible with System 7.) If *mostly compatible* means that the software does everything but print, then I wonder if Dr. Jeekyll would be considered mostly professional.

I had determined that the **P2** definition on page 2 was responsible for the printing error, because it contained the offending *exch* command, but I wondered if other graphics in the file also contained this definition, which would make them printing risks too. To investigate, I searched the PostScript file for other instances of *Silicon Beach*. The first instance appeared on page 1 at line 660. This definition, also of **P2**, was similar to the one on page 2,

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which was my primary suspect. Page 1 also contained three other SuperPaint definitions for P2, all of which contained the offending exch command.


But one thing didn't quite fit. If the SuperPaint P2 definition was the culprit, then why didn't the error message appear until after page 1 had been processed? (Remember, when the error occurred, PrintMonitor showed that there were eight pages left to print.) This indicates that the printer could interpret a similar SuperPaint definition on page 1 without error. But I remembered that the printer had a buffer and figured that the printer had discovered the offending exch command on page 1 as the LaserWriter driver was loading the instructions for page 2. This explains why page 1 never came out of the printer even though the printer had already accepted all the PostScript instructions to print it. Aha!

I decided to test the seven graphic images on the first two pages by printing them individually from a Word document. The pattern was immediately obvious. The graphics that printed without any problem were bit-mapped images created in SuperPaint's Paint layer. The images that wouldn't print under System 7 contained object-oriented graphics produced in SuperPaint's Draw layer. To test this theory, I used a screen-capture utility to take screen shots of all the object-oriented graphics in the Word document. Then I replaced the suspect graphics with the bit-mapped screen shots. After I tried this, pages 1 and 2 — and the rest of the document — printed without error.

Finally, I had solved the mystery of The File That Wouldn't Print. But solving the printing problem created a new dilemma for the client. Although the screen shots fixed the printing problem temporarily, their quality was much poorer than that of the original artwork. If the client wanted to maintain the quality of the object-oriented graphics, he needed to fix the problems with the original images and then reimport them into the Word document.

The client had several options, all of which would require some effort. Upgrading to SuperPaint 3.0 and using it to open and resave the original object-oriented graphics would likely fix the printing problem, because this version was System 7-compatible. Otherwise, the client could open the graphics in another drawing program, such as MacDraw or Canvas, and resave them. Presumably,

these programs wouldn't have the same printing problems as SuperPaint 2.0. He could also re-create the graphics from scratch in another program. Yet another possibility was to convert the images into bit-mapped graphics (in SuperPaint or

another program), but they would lose the smooth curves and high resolution of the original object-oriented images. 

Kurt VanderSluis is president of The Network Group, a training and consulting firm in Seattle.

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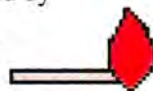
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With just 250 or so shopping days till Christmas, what do you get for the lucky person who already has a PowerBook 170? How about a Type 1 PostScript font that lets you sign your name in your own handwriting with a single keystroke? Perfect for fax-modem correspondence. Just send \$79 and an unlined sheet of white paper with ten signatures in black ink to Allen Associates, 27 Colden Hill Road, Newburgh, NY 12550; (914) 566-1425. And if you say you want a TrueType version too, the company'll throw one in at no extra charge.

By James Bradbury

Waste is a terrible thing to mind: Especially if your office is sharing a PowerBook among several users. How can you be sure that a confidential memo you put into the Trash won't be resurrected by some Norton Utilities-toting coworker who'll subject you to Bryant Gumbelian humiliation? TrashMaster, from HandOff, of Allen, Texas ([214] 727-2329), is a control panel that makes it easy to erase confidential files completely from a hard disk so they can't ever be resurrected. The \$69.95 utility also sports a host of other Trash-customization options that give you total control over what gets deleted when.




In the 'Cards: By the time you read this, Claris should be shipping its new QuickTime-savvy HyperCard 2.1. As an upgrade, it'll cost you \$15. Call (800) 544-8554 or (800) 668-8948 (Canada) for upgrade information. **X** Meanwhile, **Aldus** has released its \$299 System 7-savvy SuperCard, which can open HyperCard 2.0 stacks. (800) 333-2538 or (206) 622-5500. **X** Whichever 'Card you decide to use, take a look at the free stack by Erik Marcus called **VeggieCard** — it'll tell you everything you ever wanted to know about vegetarianism. After all, the Mac was the brainchild of a vegetarian who named his company after a fruit. Available from ZiffNet/Mac and other on-line services.

Back basics: Your spine has 24 vertebrae, but it takes only one of them to make your life a misery. A couple of "portable" ergonomic products that might keep that from happening: The \$39.95 Back-Up, from Nada-Chair, of Minneapolis ([800] 722-2587 or [612] 623-4436), has been a popular attraction at Mac shows for years — it's essentially a lower-back pad with two straps that fit around your knees. It looks strange, but it's comfortable and lightweight and it really does seem to encourage better posture. **X**

Notebook users might also want to check out the \$295 Edelson Desk, from Nathan Edelson, of Missoula, Montana ([800] 735-0885 or [406] 721-5997). It's portable (OK, at 20 pounds, it fits Apple's old definition of portable) and lets you work seated, standing up, or on the floor. (A more elaborate version for deskbound Macs is also available for \$495.)

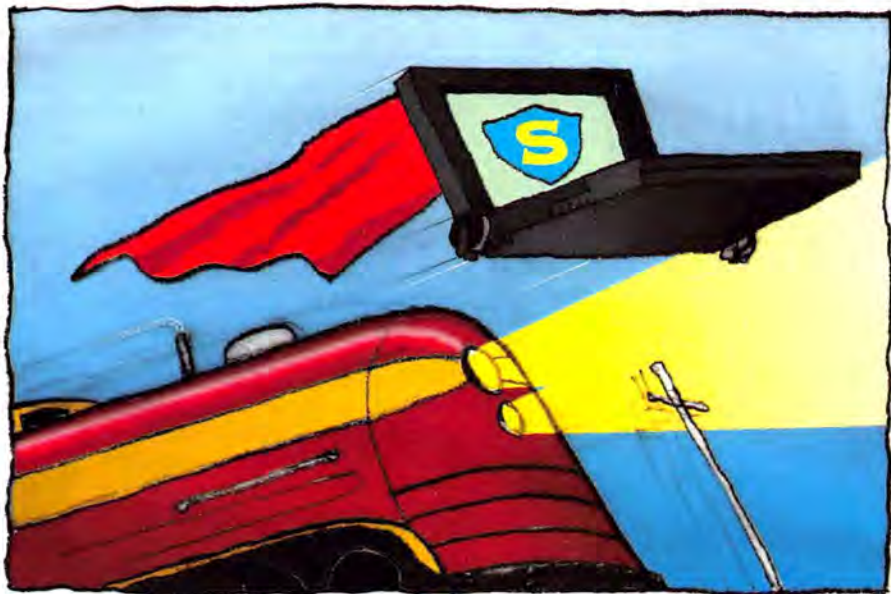


Around the world in 80 megabytes: Kids who are interested in exploring the world on a different level — that of ecology — might be interested in **Earthquest Explores Ecology**, a \$59.95 interactive encyclopedia that explores various ecosystems. Fifteen interactive games, including one featuring "renegade vegetables" (gee, they didn't mention *them* in VeggieCard), keep things interesting. Available from Earthquest ([415] 321-5838). 

More-Powerful PowerBooks

Turn your PowerBook into a SuperPowerBook by adding a few nifty features Apple left out.

By Steven Bobker



PowerBook sales are exceeding all projections (well, maybe not mine, but almost all others). The PowerBooks are revolutionary — as important as that first Mac in 1984 and more significant than the Mac II. They are fundamentally changing the way many people compute, and they'll bring many new users both to Apple and to personal computing. By the end of 1991 (a scant 72 days after the PowerBooks' release!), Apple vaulted from being a no-show in the notebook market to being the third-largest notebook shipper in the U.S. (after Compaq and Toshiba).

What can you, a PowerBook user, do to make your notebook Mac an even better, more powerful, and more useful tool? In other words, what's lacking in Apple's current models? The main deficiencies are the lack of video output and the lack of memory (and for some, hard-disk storage space).

A View with More Room

The PowerBooks have been criticized for not providing gray-scale on-board video or a video-out port. A video-out port would let you connect an external monitor to your notebook, and it is a common feature on mid-to-high-priced DOS notebooks. Such ports provide color output (from color-capable machines) and access to larger monitors. Apple reasoned (correctly) that it would be better to let third parties offer video-out options for those who wanted them and to translate the resulting savings into lower PowerBook prices.

Built-in gray-scale screens are a different matter. They make sense for all PowerBook users, and they'll probably be an option from Apple soon. I'm glad that Apple didn't delay the PowerBooks in order to include gray-scale capabilities, but I do expect to upgrade my own PowerBook once gray-scale screens become available at reasonable prices (this year, I suspect).

For those who do want video-out capability, two kinds of solutions are available right now. The Envisio approach is to provide an internal video board and video-out connector, whereas Radius and others put video output onto the SCSI bus. At press time, only Envisio and Radius were shipping products, but by the time you read this, RasterOps, Computer Care, and others will have weighed in.

Boards from Envisio ([612] 653-7694) work well and are very elegant. The tiny, beautifully made boards and connectors are works of art as well as excellent from an engineering standpoint. Envisio offers two products: the Notebook Display Adaptor for the PowerBook 100 and the Notebook Display Adaptor 030 for the 140 and 170. The Notebook Display Adaptor uses the 100's memory-expansion connector and comes with either 1 or 2 megabytes of additional memory (these two configurations retail for \$695 and \$895, respectively). The board has a tiny (about $\frac{3}{16}$ inch x $\frac{1}{8}$ inch) connector that exits through a replacement backup-battery door. An adapter then plugs in and connects to your video cable. The

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PowerBook 100, and thus the Notebook Display Adaptor, is capable of only 1-bit (monochrome) output. The Notebook Display Adaptor works with all Apple black-and-white monitors (the 13-inch, 15-inch Portrait, and 21-inch) and also most 19-inch black-and-white monitors. It should also work with VGA monitors (the high-resolution monitors of the DOS world).

The Notebook Display Adaptor 030 supports all Apple monochrome and VGA monitors as well as 8-bit color on the Apple 12-inch and 13-inch RGB monitors. Its tiny connector exits through a special replacement cap for the screen hinge (that rounded piece on the left end of the hinge). It has 0, 2, or 4 megabytes of on-board RAM, for a retail price of \$795, \$1,195, or \$1,595, respectively. A RAM-expansion connector lets those whose PowerBooks started life with 4 megabytes continue to use their Apple 2-megabyte RAM cards (which would otherwise be leftovers).

The Envisio products' performance is great — the adapters supply normal video output. The software allows two options. You can have a two-monitor setup, with different material on each screen, or in Presentation mode, you can mirror what's on the PowerBook screen on the external screen. Although installing the board yourself voids your PowerBook warranty (you're supposed to get a dealer to do it for you), the superb manual makes it nearly foolproof.

Radius' PowerView SCSI solution also works well. I noticed no speed difference, even when using complex color graphics, between a PowerView-equipped 140 and an LC. The only problem, and it's a minor one, is that the PowerView package has too many parts. There's the main box itself, a large adapter with cable, a separate large and heavy power cord, and a bulky SCSI cable. All told, it's less portable than the PowerBook! Still, it's a nice product at a reasonable price (\$599).

Talking to the World

The Apple-provided fax modem (the one that got such nice preliminary reviews) is overpriced, underpowered, and not quite Hayes-compatible (try sending it a ++, and see what doesn't happen). Unless you get stuck with one in a 170, it's a poor choice. At press time, PSI Integration ([800] 622-1722 or [408] 559-8544) was shipping a much better unit, the PowerModem, which lists for \$299 and is available for much less.

The PowerModem is a 2,400-bps data/9,600-bps fax-send and 4,800-bps fax-receive unit. The fax software was written by STF and is excellent. The interface is even better than that of the vaunted Apple fax modem (Option-Command-Print, for instance, sends a fax without making you resort to the Chooser beforehand or afterward). You provide your own data software for this totally Hayes-compatible modem. Installation is supposed to be only by a dealer, but putting the modem in yourself is a snap.

Lifetime Memory and Global Village have also announced PowerBook modems. Both should be shipping by now.

Do You Remember?

The most important add-in for all PowerBooks is still more RAM. Adding RAM should be your first priority if your PowerBook came with only 2 megabytes of RAM and should be your first priority even if you started with 4 megabytes. All PowerBooks can hold and use a maximum of 8 megabytes of RAM. Shoot for that amount.

RAM for PowerBooks comes in two types: dynamic, or DRAM, and pseudo-static, or pSRAM. pSRAM is faster, generally gentler on your battery, and noticeably more expensive. Given my druthers and a fat checkbook, I'd always opt for pSRAM, but if my budget was tight, I'd rather get DRAM than no RAM at all.

There are several good sources of PowerBook RAM. TechWorks makes really small 2-, 4-, and 6-megabyte pSRAM cards of very high quality. PSI offers several kinds of upgrades. The most interesting are printed on flexible circuit boards, which lets them slide into spaces where RAM normally can't go. The bonus on the flexboards is an extra RAM socket. That means that if you have a 4-megabyte PowerBook, the 2-megabyte card you must remove before you can add more RAM won't go to waste. It can be plugged in to the flexboard, thus substantially lowering your upgrade cost.

The disadvantage of the flexboards is their fragility. I'm not shy about putting things into my 140 (the warranty on it lasted exactly as long as it took me to find the Torx T10 and T8 screwdrivers I needed to open it), but the flexboards give even me pause. I wouldn't want to put one in more than once or twice, and getting them out is tricky. But they work real well and save real money.

Other good sources for DRAM and

pSRAM cards are MicroTech International and Lifetime Memory. Lots of companies will be offering PowerBook RAM in the near future.

Carrying On

The power PowerBook user needs two bags. One is the around-town bag, the small form-fitting bag that holds the PowerBook and a few sheets of paper. This bag should fit inside a larger briefcase, if necessary. The other bag is the on-the-road bag. It's luggage that holds the Mac, spare batteries, the AC power adapter, floppy disks, papers, maybe a cellular phone or few cans of soda, and a book. The good news is that you have lots of choices; the bad news is that the quality range is as wide as the Pacific Ocean.

Sure, you can toss your naked PowerBook into a briefcase, but it deserves better treatment. At the least, Kensington's slipcase will protect the case from scratches and guard the fragile connector cover (I'm on my second back cover already). For your around-town bag, check Radio Shack, which makes (and sells cheaply) cases for its Models 102 and WP2 that fit the PowerBooks extremely well.

When shopping for your on-the-road bag, don't forget the T/Maker bag-and-software bundle mentioned in my January Personal Best column (page 193). The WriteNow word processor and the case alone make the package a good value. Other suitable cases I've examined and tortured are the MagentaCase, from Magenta Seven ([919] 787-2787), and the Ultimate Notebook EX and SL, from I/O Design ([215] 524-7277).

The best large-sized case I've seen so far is from The Madson Line ([415] 927-3600) (I bought one of these for my PowerBook). It allows you to use your PowerBook without removing it from the case and has a superior design and finish.

Psst! Wanna Run Five Hours?

Of course you do. Lind Electronic Design ([800] 659-5956 or [612] 927-6303) has a 5-plus-pound external battery. It powered a 140 for well over five hours. However, the battery's size and weight restrict it to car or local use. It's also not cheap, at \$189.95. Lind also makes an excellent \$99.95 adapter that plugs in to your car's cigarette lighter and substitutes for the normal AC power adapter.

There's another possibility that's open to many users with 6 or 8 megabytes of RAM (I hope that's eventually everyone).

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It allows five hours of use on a single charge but restricts what you can do. This method was suggested by Mark Gavini, who works for Apple's PowerBook-only toll-free SOS-APPL ([800] 767-2775) help line. Start by creating a 3-megabyte RAM

disk (set it up in the Memory control panel). Then use your Installer disks to install a *minimal* System for your particular PowerBook on the RAM disk. Strip out most fonts and anything else you'll never use. This System Folder should be

about 1.1 megabytes. Be sure it includes the Startup Device control panel. Next add a small word processor—WriteNow is an obvious choice. Finish up with some small utilities and maybe a small game or two. My setup uses 1.7 megabytes.

When using the RAM disk, turn down the brightness a bit and try not to use the hard disk. I regularly get between five and six hours per charge when I use my RAM-disk setup on a 140. Between uses I keep all the RAM-disk items in a 1.2-megabyte self-extracting compressed file, which I carry on a high-density floppy disk.

Pick of the Month


I never have understood the appeal of elaborate, action-packed screen savers. Why should I want to be amused while my computer is idle?

Wallpaper is far more useful for me. It lets me put a large attractive pattern on my working desktop. The standard Mac desktop-pattern grid is a paltry 8 x 8 pixels. ResEdit hacks let you increase that area to 64 x 64 pixels. Wallpaper provides patterns of as many as 128 x 128 pixels (for System 7 users). It comes with several hundred nice (and a few not-so-nice) patterns, and more are available from the publisher. It also has a great set of editing tools.

Wallpaper works on all color Macs and on black-and-white Macs that have Color QuickDraw, such as the PowerBook 140 and 170 and the Classic II. You have to search for patterns that look good in black-and-white, but some do. Wallpaper works under both Systems 6 and 7. It's \$59.95 list, and the publisher is Thought I Could, of New York City ([212] 673-9724). It's not exactly a must-have, but it's the neatest utility I've seen in quite a while.

April Is Easter-Egg Month

This month's Easter Egg is in QuicKeys 2.0 and 2.1. It was suggested by Timothy Dowdle, of Chula Vista, California.

Bring the main QuicKeys screen up (Option-Command-Return will do it). Next, click anywhere on the large QuicKeys logo in the bottom left corner. Wait 30 seconds or so. Enjoy. Be sure your sound is turned on. The treat repeats approximately every 30 seconds. Simply click in the dialog box to resume normal operation. 

Steven Bobker is System Operator (Sysop) for MacUser's on-line service, ZiffNet/Mac. He can be reached there at 72511,45 and welcomes comments.

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How to Buy Scanners

Having your own scanner used to be a luxury. Now, however, prices are coming down — street prices for some color scanners are less than \$1,500 — and as prices plunge, the number of uses for a personal scanner are soaring. Whether you want to scan office documents into your Mac, using OCR (optical character recognition), or just want to pick up the occasional piece of spot art, the following tips should help you find the right scanner. For more-detailed information, see “Capturing Color: 24-Bit Scanners,” December '91, page 152, and “An Inside Look at Scanners,” September '90, page 132.

By Victoria von Biel

✓ Scanners convert an image into digital information that is understood by the Mac and can then be edited on your Mac with image-editing software or — in the case of OCR — with a word processor.

✓ When comparing similar scanners, take along the kind of photograph, document, or piece of art you'll be scanning so that you can compare ease of use and the quality of results.

✓ Working with large images or images that contain several grays or colors? Look for a scanner that saves the file to disk rather than to RAM — gray-scale and color scanning require *lots* of memory.

✓ If you need to pick up fine details or type in the work you're scanning, go for a scanner with a high *resolution* (expressed as *dots per inch*, or dpi). Keep in mind that a scanner

with

high resolution picks up dirt and flaws on the original art. Standard resolution is 300 dpi.

✓ If you'll be using a sheetfed scanner to scan several documents in succession (for example, if you're doing OCR work), look for a scanner that has a remote scan button, which lets you press a button everytime you insert a new page to be scanned, as you would with a photocopier, or one that has an automatic document feeder. This will add about \$500 to the price, but it will let you load the documents, start the scanner, and then get on with other work.

💰 You'll probably pay more if the scanner comes with image-editing software — it can be the company's own software or a commercially available product such as a special version of Adobe's Photoshop (Photoshop LE, which doesn't include separation capabilities) or Letraset's ColorStudio. The advantage of such software is that you can scan and edit the image without having to switch among programs.

✓ If you already have Photoshop, look for scanners that include a Photoshop plug-in — software that enables you to scan from within the program.

✓ If you want a scanner

for OCR work, make sure the OCR software included is easy to use and scans in text *accurately* — otherwise you may spend as much time editing the text as you would have spent typing it.

💰 For bargain hunters, most monochrome hand scanners cost less than \$500. The good news is that they're small and convenient and even let you scan on vertical surfaces; the bad news is that they're suitable only for scanning small items such as logos and aren't good for extensive OCR work.

❓ Determine how the scanner you're considering connects to your Mac. Most connect via the SCSI port (some require a special interface box to do so), a few are connected through the modem or printer (serial) ports, and others require the installation of a special card. A SCSI connection has the advantage of fast data transfer and is easy to install (all Macs from the Plus up have a SCSI port), but to avoid connection problems with other SCSI devices, find out if it has a pass-through connection. Otherwise the scanner may need to be at the end of the chain, which can be inconvenient. ⚠️



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POWER TOOLS

Turn your notebook Mac into a desktop Mac with the Intelligent Monitor from Outbound Systems. The monochrome portrait monitor, which should list for around \$700, has a built-in video board, so it can be connected directly to any Mac's SCSI port. Designed for Outbound's NoteBook 2000 series, the Intelligent Monitor also expands the horizons of Apple's PowerBooks as well as compact Macs such as the Classic. Outbound offers a keyboard and mouse for the complete desktop experience. (303) 786-9200.

By John Rizzo

Searching question: Which is better, CanOpener 2.0 or On Location 2.0? Answer: yes. Both can search the contents of unopened files, but each provides different capabilities. CanOpener 2.0 (\$125; upgrades are free), from Abbott Systems ([914] 747-4201), is a must-have utility that opens and copies material from files that are damaged or that were created with applications you don't have. It can also display pictures and play sounds imbedded in a file. On Location (\$129.95; upgrades are \$25), from On Technology ([617] 876-0900), provides the absolute fastest method of searching files. You must create an index of files in advance, however, so On Location can't be used as a universal browser.



Macromania: For a program that's supposed to make your life easier, CE Software's QuickKeys can be daunting to set up. Steve Roth and Don Sellers' *The Little QuickKeys Book* (\$18.95), published by Peachpit Press, lets users in on tricks that aren't in the manual. Written by a pair of devoted "QuickKies," the book is unabashedly fervent about the macro utility. The authors claim that QuickKeys is more powerful than System 7's Apple events, for example. QuickKeys fans will love it. (510) 548-4393. ➡ **Hot Keys** is a kinder, gentler, easier-to-install macro utility than QuickKeys, and it has 150 predefined Fkey macros and a keyboard overlay to show you where they are. As with QuickKeys, you can also create your own macros. GO Technology ([702] 831-3100) offers a universal version that works with eight popular Mac programs, and there are specialized versions for specific applications such as PageMaker and Microsoft Word. The new Finder version has a DA that helps you become System 7-savvy. \$59.95 per version.

Big things, small packages: Microcom's 7-ounce MicroPorte 1024 modem (\$649) can be used in your car (!). The MicroPorte uses the MNP 10 error-correction protocol, which is designed to handle finicky cellular links, and runs off AC power, a battery, or a cigarette lighter. The MicroPorte delivers 12,000 bps by using a combination of V.42bis data compression and Microcom's own Turbo mode. (617) 551-1000. ➡ **System 7** may theoretically give you access to 1 gigabyte of RAM, but the current Finder can't allocate more than 97.56 megabytes to a single application. Newer Technology ([316] 685-4904) side-steps this limitation with MacSwell, a utility that lets a memory-hungry application gobble as much as 256 megabytes of RAM. You first have to have enough RAM to support this memory gluttony, which is why MacSwell is bundled with Newer's 16-megabyte SIMM chips (\$1,200 each). ➡

Memory	
<input checked="" type="radio"/> Kilobytes	<input type="radio"/> Megabytes
Suggested Size: 4,096 K	
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The Big Screen

If you're ready to graduate to a larger monitor or you want to add a second monitor, you should know these strategies for making the most of all that CRT real estate.

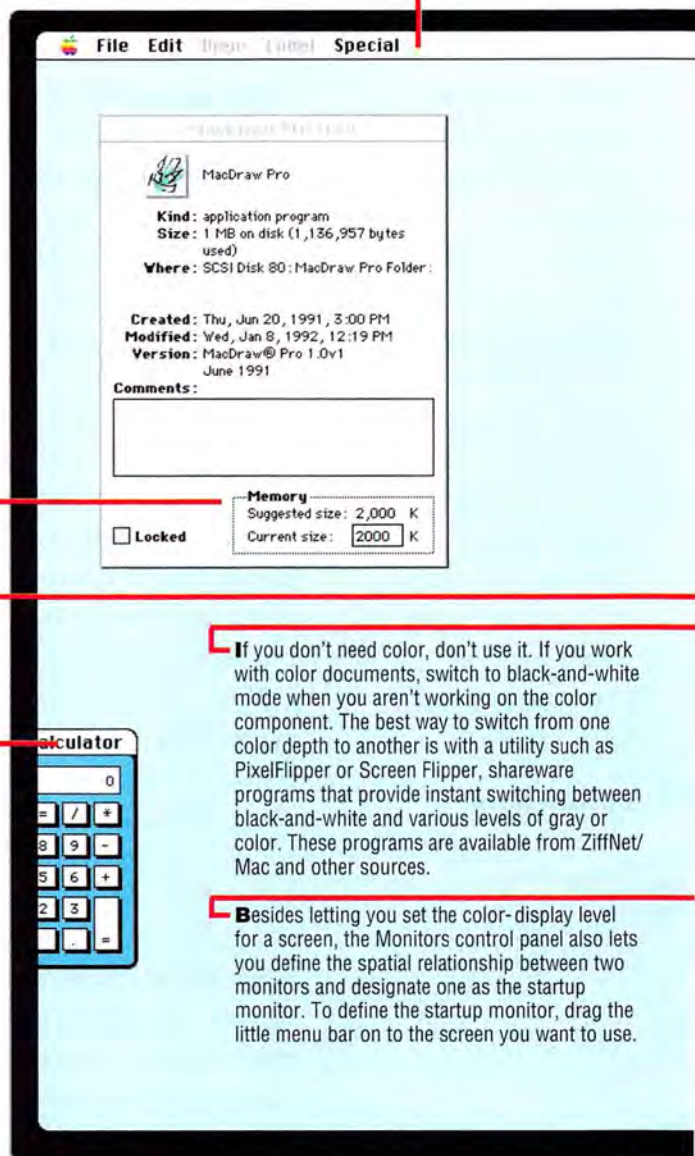
By Sharon Zardetto Aker

Some applications (such as MacDraw Pro) check the size of the screen when you create a new document window and then allocate enough memory for a document that size. So a memory partition that's sufficient for a program when you're using a small monitor may not be large enough when you use a larger monitor.

Enlarge windows only as much as needed for the work you're doing — it takes less time for the Mac to redraw a small window than a large one.

Most windows open to the spot where you last left them, but their applications are usually smart enough to make sure they're still on the screen. DAs aren't always so thoughtful, and if the monitor setup has changed since you last used the DA, its window might open 16 inches from the left edge of the screen — even if the screen is only 6 inches wide. If you know beforehand that you're changing monitors — switching the startup monitor in a multimonitor setup, schlepping your hard drive between work and home, or bringing a drive to a service bureau, for example — check that your DAs are within the boundaries of the smaller monitor before you switch.

If you're setting up multiple monitors, make sure that the upper left corner of the startup monitor isn't adjacent to another screen, or the cursor might slide to the other screen when you're aiming for the Apple menu.

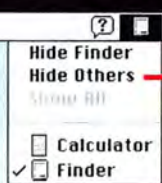
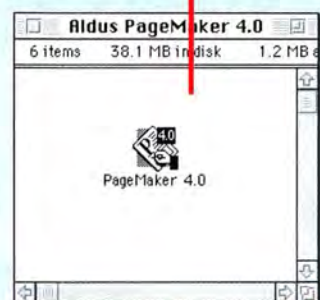


If you don't need color, don't use it. If you work with color documents, switch to black-and-white mode when you aren't working on the color component. The best way to switch from one color depth to another is with a utility such as PixelFlipper or Screen Flipper, shareware programs that provide instant switching between black-and-white and various levels of gray or color. These programs are available from ZiffNet/Mac and other sources.

Besides letting you set the color-display level for a screen, the Monitors control panel also lets you define the spatial relationship between two monitors and designate one as the startup monitor. To define the startup monitor, drag the little menu bar on to the screen you want to use.

Going to the menu bar can be a long trip from the bottom of a big screen. Solutions to this problem include using utilities such as PowerMenus, from Magic Software, and NowMenus, from Now Software's Now Utilities. Each of these programs can put the menu bar in to a pop-up menu at your cursor's location. They're especially useful if you're working with a second monitor, because you don't have to move to the screen that contains the menu bar.

Some applications (notably PageMaker) don't let you open a window any larger than the startup monitor's screen, so if you set a smaller unit to be the startup monitor, moving a document window to the other monitor makes no difference.



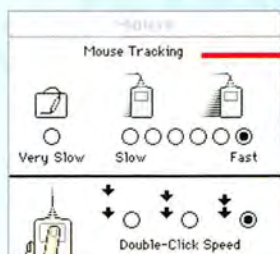
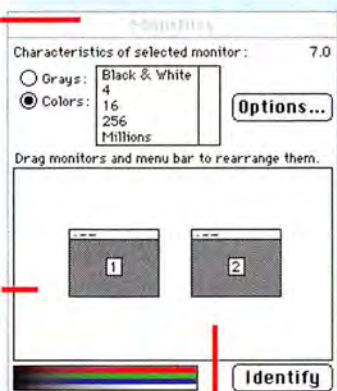
High Traverse



Anytime you move a window on the desktop, you have to wait while the windows beneath it are redrawn. Under System 6 with MultiFinder, you can minimize the number of background windows by closing any you aren't using. With System 7, you can use the Hide Others command from the Application menu to hide background windows. Use the Option key when you make a selection from this menu to automatically invoke Hide Others for the application you're moving to. You can also download a utility called HideAlways, available from ZiffNet/Mac, which keeps Hide Others on automatically.

The Trash isn't glued to the lower right corner of the screen. System 6 users should move the Trash toward the top of their screen, near the disk icons. It'll reappear at the bottom corner when you restart, but you can use a macro utility to record the repositioning for easy playback.

System 7 lets you move — and keep — the Trash anywhere, and it offers something even better in the form of aliases. Sprinkle Trash aliases around your screen and in folders for easy access.



Change the tracking speed of the mouse, using the Mouse control panel — the faster you set the tracking speed, the less distance you have to move the mouse to get the cursor to glide across the screen.

Sharon Zardetto Aker is the author of *The Macintosh Companion* and a coauthor of *The Macintosh Bible*.

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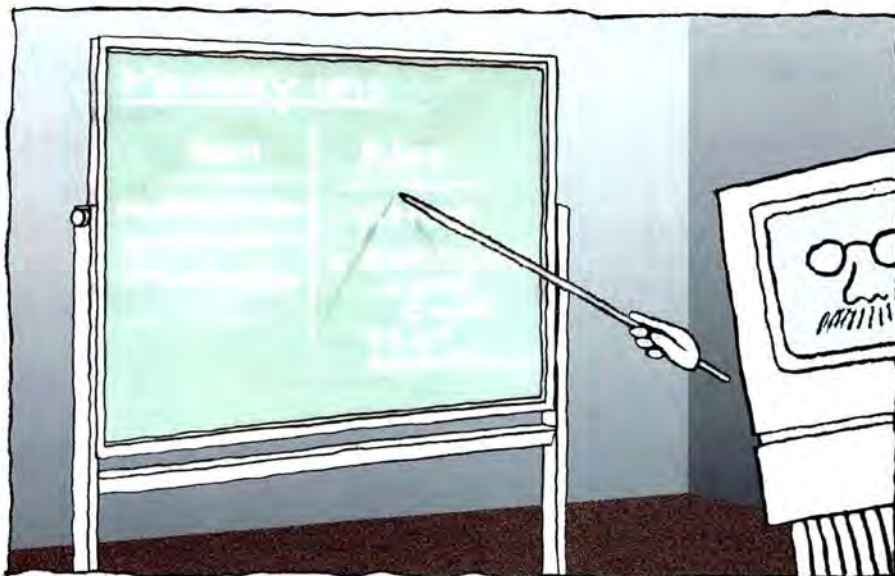
ANYTHING.



Memory 101

Welcome to a short course in managing your Mac's memory. Not only will you learn about the disk cache, virtual memory, 32-bit addressing, and RAM disks but you'll also see how they can boost your Macintosh's performance.

By Bob LeVitus



Under System 6, your Mac could have as much RAM as you wanted as long as you didn't want more than 8 megabytes. Recognizing that many of today's applications have a big appetite for memory, Apple gave System 7 the ability to access massive megabytes. On many Macs, you can install as much as 128 megabytes of RAM; with virtual memory and 32-bit addressing, you can access as much as 1 gigabyte.

The profusion of choices these days inevitably leads to more confusion. How much RAM do you really need? What is the disk cache? What does virtual memory do? Should you use it? And what the heck is 32-bit addressing?

In this "Memory 101" short course, Professor LeVitus will provide memorable answers to these questions and more.

The Basics

The Mac has two categories of memory: ROM and RAM. *ROM* (read-only memory) is permanent, nonerasable memory that resides on a chip inside your Mac. It contains basic system software for the Mac's user interface and is inaccessible to users.

When people ask you how much memory your Mac has or whether you use 32-bit addressing, they are talking about *RAM* (random-access memory). RAM is the Mac's temporary work space: It holds the current version of system software (such as System 7) plus currently active applications and files and is the limiting factor in determining the number of

applications you can run simultaneously. RAM is sometimes called *volatile memory*, because its contents are lost when you shut down or crash. RAM comes in the form of chips called SIMMs (single in-line memory modules); you can expand the Mac's memory (up to a limit) by adding more SIMMs. (For more on SIMMs, see "How to Buy Memory," February '92, page 259 and "SIMMple Pleasures," April '91, page 194.)

Under System 7, you can adjust RAM-related features through the Memory control panel. The availability of options—disk cache, virtual memory, and 32-bit addressing—depends on which Mac model you have. Every Mac has a disk cache, but virtual memory and 32-bit addressing appear only if your Mac supports them.

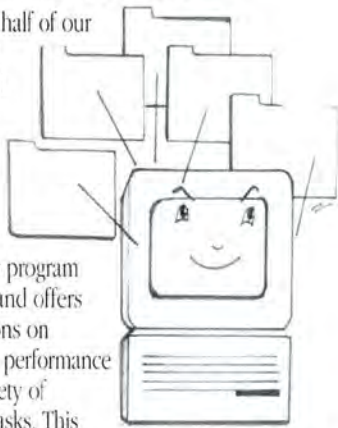
One way to get a quick performance boost is to increase the size of your *disk cache* (called RAM cache and controlled through the General control panel in System 6). This special area of RAM stores the data that's been retrieved most recently from your floppy or hard disk. If the information is needed again, it can be read from RAM far faster than from a disk. The disk cache's default setting is 32K per megabyte of installed RAM: Don't reduce it unless you need to free up every last kilobyte of memory.

If you have the RAM for a larger cache, try increasing the setting to 128K or 256K and look for subtle performance improvements. Commands such as Find and Quit should be executed faster, and switching among open

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POWER TOOLS BEATING THE SYSTEM

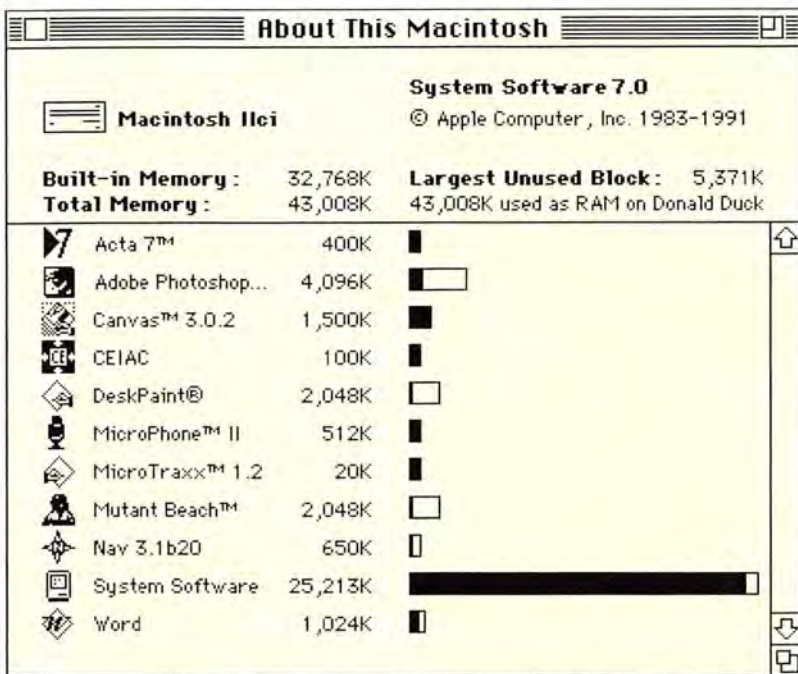


Figure 1: If you yearn to keep all your favorite applications open at the same time, you'll need a massive amount of RAM. This power-user setup combines 32 megabytes of physical RAM with 10 megabytes of virtual memory for an awesome performance increase. The 25,213K for the system software includes 21 megabytes for a RAM disk.

applications should be faster too. Don't forget that you must restart before the changes will take effect. Also remember that RAM used for the cache is not available for running applications. Don't set the cache to more than 256K — it will barely affect performance, and it needlessly wastes RAM.

To boost the performance of a specific program, try increasing its memory allocation. Simply select the application's icon, choose Get Info from the File menu (Command-I), and type a larger number in the Current Size box (this option is called Application Memory Size under System 6). This increases the portion of RAM that's dedicated to the application, allowing more of the program to reside in RAM and reducing the frequency of disk accesses. For example, PageMaker's minimum RAM allocation is 1,500K, but you should set it to at least 2,048K for optimum performance. Again, you'll have to experiment to find the optimum setting for each program.

System 7 Enhancements

If your Mac has a 68030 or 68040 CPU (or if you have a 68020 Mac II with a PMMU chip installed), you can use *virtual*

memory. Virtual memory is System 7 voodoo—it tricks your Mac into thinking that it has more RAM than it actually does. How? By transforming free space on your hard disk into pseudo-RAM. For example, if you have 2 megabytes of physical RAM and 6 megabytes of virtual memory, your Mac will *think* and *act* as if it had 8 megabytes of memory.

Virtual memory has two major disadvantages: It's slower than real RAM, and it gobbles up hard-disk space like crazy. Once you've specified an amount for virtual memory in the Memory control panel, the Mac creates an invisible file on your hard disk called VM Storage. The file is the size of the total memory — RAM plus virtual — so a Mac with 2 megabytes of RAM and 6 megabytes of virtual memory uses 8 megabytes of hard-disk space for its VM Storage file.

For the best results, don't use more virtual memory than you have real RAM. If you use more than 2 megabytes of virtual memory on a 2-megabyte machine, for example, you'll experience a major performance slowdown as data is constantly swapped on and off the hard disk. Once again, experiment with the setting. What I perceive as painfully slow may not

The System 7 File: Hide and Seek

One of the great features of System 7's Applications menu is its Hide Others command. Invoking this command makes all background applications invisible, leaving only those windows related to the foreground application and greatly reducing desktop clutter and confusion. Hide Others is particularly useful in the Finder if you want to view files or folders on your desktop but still keep an application running in the background.

The only problem with Hide Others is that you have to choose it whenever you switch applications; otherwise, the windows of the formerly active application remain visible. One way around this is to hold down the Option key each time you choose another program from the Application menu. This hides the windows of the formerly active program. A better solution is *MacUser's* Utility of the Month, HideAlways, which always keeps only the active application's windows showing by automatically hiding formerly active applications.

HideAlways is a System 7 extension written by Mike Throckmorton, an Ann Arbor, Michigan-based developer who's also written two other Utilities of the Month, DiskSwitch and ZMakeAlias. All three programs are available exclusively on ZiffNet/Mac (part of CompuServe), in Library 3 (Extensions) of the Download & Support Forum (GO ZMC:DOWNLOAD). The filename for HideAlways is HIDEAL.CPT.

bother you. Most people should reserve virtual memory for occasional use when they temporarily need more RAM than is physically installed.

Most Macs can access up to 128 megabytes of physical RAM and as much as 1 gigabyte of virtual memory with 32-bit addressing. The explanation of what it is and how it works is beyond the scope of this article; suffice it to say that if you want to use more than 8 megabytes of RAM, you must turn on 32-bit addressing. If your Macintosh has more than 8 megabytes of RAM, the extra RAM will be ignored unless you boot with 32-bit addressing turned on.

Which Macs support 32-bit addressing? The answer is a bit complicated. Machines with a 68000 CPU — the Plus, SE, Classic, Portable, and PowerBook 100 — don't support it at all. Macs with a 68030 or 68040 CPU and "32-bit clean" ROMs — the LC, Classic II, IIsi, Ilic, IIfx, Quadras, and PowerBooks 140 and 170 — fully support 32-bit addressing.

But four 68020 and 68030 Macs — the II, IIfx, IICx, and SE/30 — have "32-bit dirty" ROMs, which prevent them from supporting 32-bit addressing unless you install a little program called MODE32. MODE32 was developed by a company called Connectix as a commercial product; Apple acquired an unlimited license to it in September 1991 and began distributing it for free. You can get a copy from user groups, on-line services, and dealers.

One last thing you should know about 32-bit addressing: It's incompatible with many older applications, INITs, and control panels. If you run into a compatibility problem, you can usually turn 32-bit addressing off, restart the Mac, and run the

program successfully. Many companies already have 32-bit-clean upgrades for their products.

RAM Power

Probably the most compelling reason to have more than 8 megabytes of RAM is that you can keep a bunch of programs open at the same time. INITs and control panels load when you start up the Mac, but do you know where they load? They load into memory, leaving less RAM available for running programs. For example, my System 7 software — which includes almost 30 INITs and control panels — chews up almost 5 megabytes. On an 8-megabyte Mac, that would leave 3 megabytes, enough to run only one or two programs.

Installing large amounts of RAM also lets you open larger files. If you use programs such as Photoshop or MacroMind Director, work with digital audio or video, or do 3-D rendering, you may need more than 8 megabytes simply to open files.

If you *really* want to be a power user, get enough RAM to create a big RAM disk. A RAM disk is a portion of memory that's configured to look and act just like a hard disk. You can modify the contents of a RAM disk as if it were a hard disk, but because all operations take place in memory, performance is enormously enhanced. Copy an application to a RAM disk, and it will run like greased lightning. Stash your System Folder on the RAM disk, and the Finder really burns rubber.

Unfortunately, RAM disks have a couple of serious drawbacks: For one thing, they're extremely volatile. If the power is interrupted or you have a bad crash, the RAM disk's contents are lost forever — unlike with a real hard disk. Whenever

you turn off your Mac, for example, the RAM disk is erased, and you must recopy its contents whenever you start up. RAM disks are also expensive. To create an effective RAM disk, you need 2 to 4 megabytes beyond what your system and applications use — and much more if you want to store several applications on it. In most cases, this means endowing your Mac with at least 20 megabytes of RAM.

Creating a RAM disk from on-board memory requires a RAM-disk utility. There are several available, including two 32-bit-clean shareware programs, AppDisk and RamDisk+, which are available from on-line services and user groups. (On ZiffNet/Mac, these utilities are available in the Download & Support Forum [GO ZMC:DOWNLOAD]. AppDisk is APPDSK.CPT in Library 3 [Extensions], and RamDisk+ is RAMDSK.SIT in Library 1 [Applications].)

Maxima, a \$129 commercial utility from Connectix, takes the RAM-disk concept one step further. It maintains a copy of its contents on a hard disk, so they aren't lost when you shut down or crash, meaning that you can boot your Mac from the Maxima RAM disk — one of the coolest uses for a RAM disk.

To get some hands-on experience with System 7's new memory capabilities and the Maxima RAM disk, I added a 32-megabyte RAM upgrade from Technology Works (around \$1,000 at press time) to my 8-megabyte Mac Ilic. Wow — booting and running programs from a 20-megabyte RAM disk is awesome! And with 12 megabytes of real RAM left over, plus another 10 megabytes of virtual memory, I'm able to keep open everything I might need — for days (see Figure 1).

Well, class, that's all we have time for today. Your homework assignment is to get a copy of *The Macintosh Memory Guide*, free from Connectix ([800] 950-5880 or [415] 571-5100) and read it from cover to cover. This informative, clearly written booklet is only slightly biased in its coverage of SIMMs, clean and dirty ROMs, virtual memory, PMMUs, RAM disks, and other memory-related topics. It also includes a lucid discussion of 32-bit addressing and a reference section that presents the memory capacities and specifications for most Mac models.

Class dismissed. ☐

Bob LeVitus is the author of the just-released *Dr. Macintosh, Second Edition* as well as several "Stupid" books.

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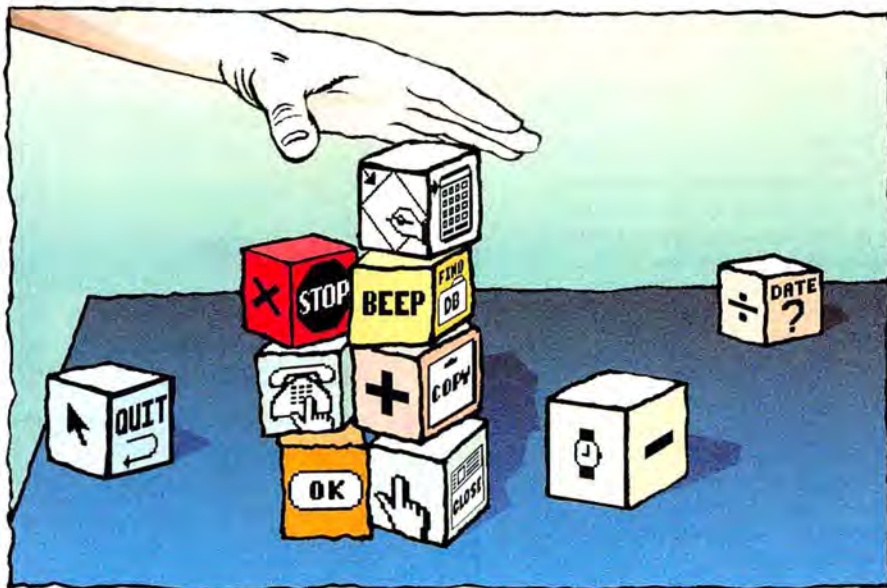
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Let's Get Visual

With the advent of visual programming, if you can click and drag, you can write useful code.

By Andy Ihnatko



Writing software is fun. Trust me, there's no greater rush than having a real dopey idea and turning it into a real dopey program. Who wouldn't want to write a best-selling program and create a corporate juggernaut of such phenomenal wealth and power that you could afford to alienate both Apple and IBM?

Unfortunately, many people are scared by one small detail: They haven't the foggiest idea of how to write software. Enter VP (visual programming), a radically different way to write code. Instead of making you type line after line of marginally English-like commands and statements, VP packages, such as TGS Systems' Prograph and Serius' Serius Programmer, let you "write" a program by linking graphical objects that represent segments of prewritten code. The result is a stand-alone application that, in theory, is written by a mere mortal in a fraction of the time it would take with a conventional programming language, such as C or Pascal.

Does visual programming deliver on its promise of giving you a simple yet powerful way of writing your own applications? Maybe.

Traditional Versus Visual

The programmer's equivalent of "Chopsticks" — the first minimal program you write when you're learning a new language — is a "Hello" program that displays a silly message on-screen (see Figure 1). When written in Symantec's THINK C, even the simple phrase

in this figure can confuse budding programmers. Most folks deduce that `printf` must be some sort of printing command, but the `\n`, semicolon, brackets, and `main()` are all somewhat mysterious, because they serve only to help C understand the program's structure.

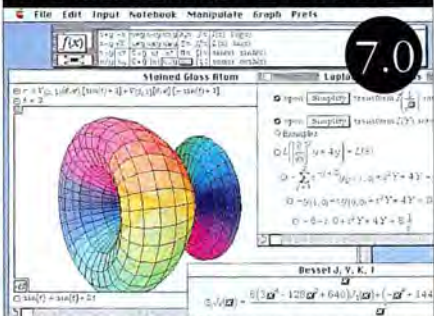
This same program is much easier to understand when you write it visually with a package such as Prograph. Knowing that the program displays a message, you can logically figure out how it works. It's clear that the `show` object somehow takes whatever phrase is fed into it from the top and produces it on-screen. No muss, no fuss. Behind the scenes, `show` — the iconic representation for a bundle of prewritten code — creates an alert box, sticks in an OK button, outlines it as the default, and displays the message in a specific font.

This example illustrates three nifty features of visual programming: It's easy to learn, it's easy to use, and it hides most of its complexity from a bewildered programmer. All of this means that you can create a usable program very quickly. You don't need to care about the Mac's Dialog Manager, Control Manager, QuickDraw, or any of the other Toolbox machinery. Instead of writing a few dozen lines of C or Pascal, you need know only about the `show` object and its parameters.

Hacking Visually

What makes visual programming so attractive? Gizmos. *Gizmo* is my term for each bundle of prewritten code that is represented

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— MacWorld magazine, May 1990.

— Five mice review, MacUser magazine, June 1990. ★★★★★

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POWER TOOLS POWER PROGRAMMING

Figure 1: How to Say "Hello"

a

```
main()
{
    printf("Darkwing Owns The Night!\n");
}
```

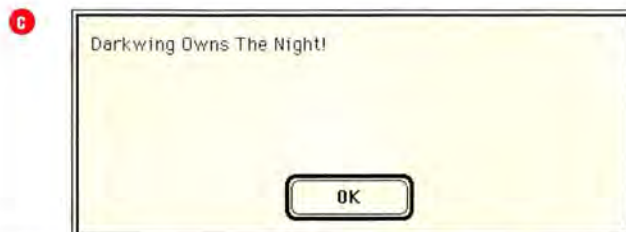


Figure 1: A simple "Hello" program that displays a message on-screen (c) can take radically different forms. With Symantec's THINK C (a), creating even this simple phrase might confuse a budding programmer, but it's much easier to understand the program when you write it visually with Prograph (b). It's obvious that the `show` object simply takes whatever phrase is fed into it from the top and produces it on-screen.

by an icon in a VP program. Prograph calls them *modules*, and Series Programmer refers to them as *objects*. For simplicity's sake, I'll use gizmos.

The beauty of VP is not so much that you're sliding little rectangles around instead of typing arcane commands; it's the insanely great way that VP packages write most of the code so all you do is fill in the blanks. All VP packages come with a variety of gizmos, each of which does one simple task. By linking the gizmos, you can create full-featured applications that handle such complex tasks as telecommunications, database management, drawing, painting, or animation.

Let's say you've got a hankerin' for some breakfast, so you dig through your VP package's documentation, and lo and behold, there's a *toaster* gizmo in there. You couldn't care less whether it's a two-slicer or a four-slicer or if it toasts by using nuclear fission. If you want toast, you need only feed it some bread and specify the toasting level.

But suppose you want buttered toast as

part of a complete Cap'n Crunch breakfast like you see on TV. No problem. Simply link the appropriate gizmos (see Figure 2). It's easy to figure out how the program works; all you have to remember is that it flows from top to bottom, with the bottom-most element being the final product of the routines. I'll leave the code for the rest of the breakfast up to your imagination. I needn't say how different this program would look in Pascal.

The Dark Side of the Source

At this point, you're probably thinking, "If visual programming is so wonderful, why isn't everybody using it?" The truth is that VP has some serious drawbacks:

The Maytag Syndrome. It's a C and Pascal world out there. You'll realize just how lonely visual programming can be when you look for books to teach you how to program, for information on algorithms, or for support from your programmer peers on sticky debugging problems. Popular VP packages such as Prograph and Series Programmer have strong followings, and

Figure 2: Programming Made Easy

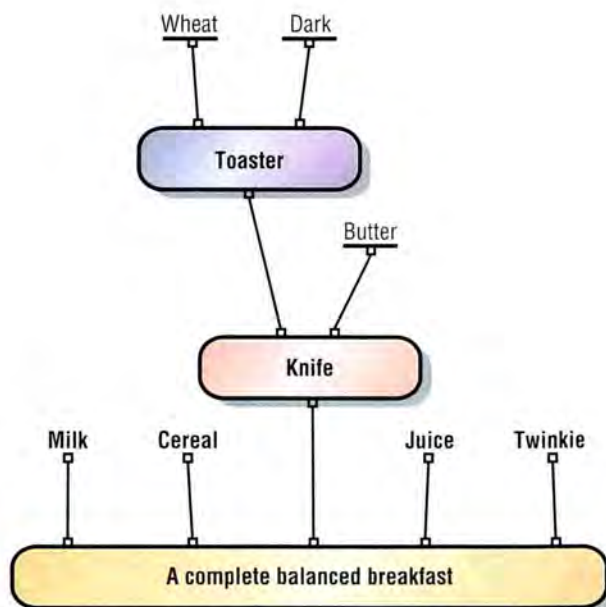


Figure 2: With a VP package, you can quickly create a full-featured application simply by linking the appropriate graphical objects. In this case, we want to include some buttered toast as part of a complete breakfast: We hook the toaster gizmo to the knife gizmo, and so on. All you have to remember is that the program flows from top to bottom, with the bottommost element being the final product of the routines.

support is always available from their publishers and from on-line services, but the interplanetary popularity of C and Pascal is hard to beat.

You Can't Always Get What You Want. With VP packages, the kinds of functions you can put into a program are limited by what gizmos are available. It may be impossible to put a floating palette or custom menu definition into your program, because the package's designers failed to provide such gizmos. Sure, you can usually write your own gizmos in C or Pascal, but isn't that what you wanted to avoid in the first place?

Spaghetti Code. Project management is also a little stickier when you use visual programming. As a project gets larger and more complicated, it gets increasingly difficult to look back and get a sense of how the program flows and executes. It's extremely important to maintain a clear vision of your objective and keep detailed notes about your program's various functions and modules, which ones have been completed and which still need some work. Without these records, a week's vacation from your Mac can lead to hours

of frustration as you struggle to pick up where you left off.

Porky Programs. Invariably, applications written with VP packages consume an obscene amount of disk space and run disgustingly slowly. VP code can be eight times as large as a comparable C program and nearly unusable on slower Macs because of the overhead. When you run a VP application on a Mac Plus, for example, you can make a sandwich while you're waiting for a sentence to appear on-screen. This pokiness is the most serious drawback of VP.

So Why Even Bother?

Certainly you'll never see a major commercial product written with a VP package, but there are still situations where visual programming excels. Rather than developing a database or telecommunications tool with commercial software such as FileMaker Pro or MicroPhone II, you can use the prefab database and telecom gizmos that are available with some VP packages to quickly build a custom application that meets your needs. You can take advantage of all elements of the Mac's



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user interface, and you won't have to hire a programmer. Better yet, your users won't have to pay hundreds of dollars for the commercial program.

Even "real" hackers, who'd rather eat vegetables than use visual programming,

must admit that VP is splendid for testing program design. Prototyping utilities such as Prototyper and AppMaker already exist, but they don't let you model an entire program in the same exact, functional detail that VP packages do.

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Visual Packages for the Mac

The two most popular VP packages for the Mac, Prograph and Serious Programmer, represent opposite ends of the spectrum. Prograph is closer to a "real" language than is Serious Programmer. In addition to all-in-one gizmos, Prograph has graphical objects that represent almost everything in the Mac's Toolbox; any Mac program that can be written in C can be written with Prograph. The trade-off is ease of use. Prograph makes you wade through a fat tutorial book — it's exceptionally clear and well written, but it's still a big book — before you can write an application of any complexity.

So it takes several weekends of study to understand how Prograph works; in contrast, you can go from breaking the shrink-wrap on Serious Programmer to writing an impressive application in a single afternoon. Serious Programmer is fundamentally simpler; it contains many more all-in-one gizmos, and you're completely insulated from the Mac's Toolbox and its complexity. As you can guess, Serious Programmer's faults are the opposites of Prograph's. Sure, with a single gizmo, your program can provide a complete MacPaint-type graphics program, but it's considerably more difficult to make that program draw a series of lines in a window.

Persistence of Vision

Visual programming has arrived, and it's here to stay. As the storage capacities and raw speed of personal computers continue to increase and more advances are made in the development of visual-programming packages, the porky, sluggish nature of programs built visually will become less of an issue.

For the moment, visual programming must be content to occupy no more than a niche in the Wide World of Software. If you're truly interested in Mac programming, your best bet is to buy a copy of THINK C or Pascal, get a good tutorial (such as any of Dave Mark and Cartwright Reed's excellent books), and start hacking. In truth, you can teach yourself Macintosh programming in about four months.

In a nutshell, the desire to wrest software development from the grasp of the technical-class bourgeoisie and make it simple enough for the proletariat is a good one, but the visual-programming revolution is still a long way off. ☐

Contributing editor Andy Ihnatko considers programming a wonderful way to avoid actual work.



Do you have an undocumented Macintosh tip you're willing to share? MacUser pays \$25 for every tip used, and the Tip of the Month earns \$100.

✉ Send your tip, together with your name, address, and phone number, to Tip Sheet, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

You can also contribute tips electronically via Ziff-Net/Mac, the on-line service for MacUser. Send them to Gregory Wasson at 72511,36. Be sure to include your full name and mailing address along with the text of the tip.

Compiled by
Gregory Wasson

Word Processing

There's not a whole lot you can do about poor underlining of letters with descenders — for example, when you underline a word such as change and the *g* gets sliced through. Words with such letters in the middle look better if you change the offending letter(s) to plain text and leave the rest of the letters underlined.

Clayton L. Olson
Santa Cruz, CA

AppleShare (System 7)

Accessing a shared file, folder, or volume through the Chooser requires seven mouse steps. Creating a folder of aliases for shared items and leaving it on the desktop or on your Apple menu allows access in two mouse steps. To access a particular shared item, simply open the File Server folder and double-click on the alias of the desired item. In the Password dialog box, just enter your password (if applicable) and click on OK.

Better yet, you can access the File Server folder directly from the Open dialog box within an application. Just click on the Desktop button, double-click on the File Server folder, pick a shared item, and double-click on it.

When the time comes that everyone on the network keeps a File Server folder of aliases instead of the actual shared files on their desktop, at day's end, as people start to shut down

their Macs, you'll be less likely to see a flurry of Shut Down Alerts across the network.

Howard A. Partner
Raleigh, NC

Finder

Many applications include utilities or commands for erasing and reformatting a series of floppy disks. Yet there are occasions when you have to rely on the Erase Disk command of the Special menu in the Finder. Here's a trick to speed things up if you have two floppy drives:

Insert the two floppies you want to reformat or erase, and highlight the icons of both disks on the desktop. Now you can use a single Erase Disk command for both disks, with only two prompts required during the process. This shortcut is also useful for reformatting multiple partitions on a hard disk.

Dennis Reynolds
Freeville, NY

Microsoft Excel 3.0

When working on dissimilar, multiple spreadsheets simultaneously in Excel, I find that the Workgroup command saves me critical time. Although the Workspace command brings up multiple spreadsheets, it doesn't let you work with them all at the same time. Workgroup, however, lets you save and print the dissimilar spreadsheets without going into

Tip of the Month

Microsoft Word

If you find yourself restricted to a word-processing program for DTP after experiencing the relative luxury of a dedicated DTP product, you'll quickly begin to miss the ability to set predetermined spaces. Word, for instance, has a nonbreaking space, but that's it. You can, however, create spaces by "whiting out" characters of the desired width — namely, an em dash, an en dash, or any number (in most fonts, all numbers are the same width to aid in alignment; see Figure A).

Here's how to do this in Microsoft Word: Type a dash or a placeholder number, select it, and choose White from the Character dialog box. You can assign a key combination to White and Black through the Commands option on the Edit menu, or you can use a macro program to create

the entire space. This technique greatly speeds up typesetting chores in which lots of specified spaces are needed.

Dashes in text should have a tiny bit of space on both sides. Normally typesetters use one or two units, with units being defined as $\frac{1}{18}$ of an em. You can create your own thin space in any program that allows you to print in white by using any punctuation mark, such as a period or a comma, that is the same width as a thin space. Store the entire dash-with-spaces combination in a macro, and you'll be able to provide the perfect dash instantly.

In Show Paragraph mode, Word does not display white text as invisible, although the text does print that way.

Bob Terry
Austin, TX

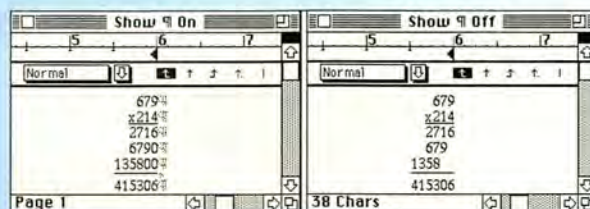


Figure A: An innovative use of white-on-white text in Microsoft Word makes it possible to create fixed spaces — useful for aligning numbers.

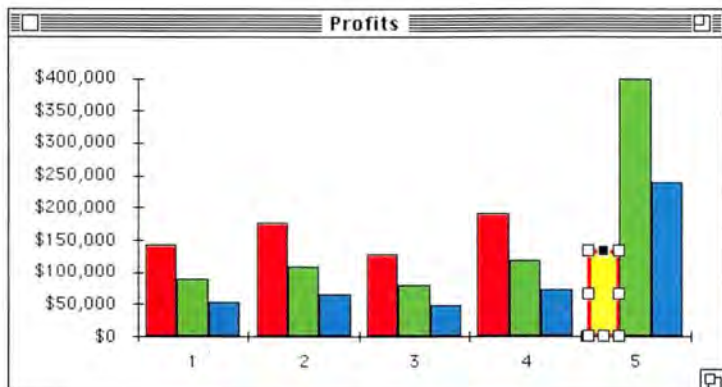


Figure 1: Using the Command key lets you restrict pattern/border changes to just one bar in an Excel chart.

Normally when you create a chart, you highlight all the columns and rows starting from the first cell and work your way down to the last cell. Sometimes, though, you might want to exclude a certain row between the first and the last cells. The Command key comes to the rescue once again. Select all the rows up to the row you want to exclude, in normal fashion. Now hold down the Command key, and choose only the rows after the excluded row. Click on the Chart button to create the chart.

Jojo Mendoza
Springfield, VA

InTouch 1.1.5

InTouch 1.1.5 is a great program, but it has one annoying feature — the first record of the file is preset with the name and address of the publisher,

each separate sheet. For example, I had 20 interactive spreadsheets arranged on my screen and did not want to save and print 20 separate times. I simply selected all the spreadsheets in Workgroup, and with just two commands — Save and Print — all my work was done for me. However, be

careful not to make layout changes to one sheet or all the sheets will be changed.

Sharla Vohs
San Francisco, CA

Here are a couple of Excel tips that will help put you in command of the program:

To modify the pattern,

foreground, and/or border of one occurrence of a bar representing data in a bar chart, hold down the Command key and double-click on the desired area. Make your modifications, and click on OK. The other bars of the same original color will remain unchanged (see Figure 1).

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Advanced Software, and this information normally can't be modified or deleted. The following tip lets you change it to whatever you want:

1. Open a copy of the InTouch DA suitcase with ResEdit.

2. Open STR#-15999.

3. Scroll down to string 17 and 18; these are the left and right sides of the first record, respectively. Change them to whatever you like.

4. Quit ResEdit, saving your changes to the InTouch DA suitcase. Install the modified InTouch DA suitcase.

5. InTouch creates the permanent first record when it creates a new InTouch file. Create a new InTouch file, and you'll have your personalized permanent record as the first record. You can then export your existing entries (if any)

from your old InTouch files and import them to new ones.

Russell Salerno
East Meadow, NY

RasterOps

I use a Mac SE/30 with 8 megabytes of RAM, a RasterOps 264/SE30 card, and a Mac 13-inch RGB monitor. Because there's no way to turn off the RasterOps card, if your control panel is set to display the menu bar on the external monitor when you take your Mac out of the office without the external monitor, you have to remember to change the control-panel setting to display the menu bar on the internal monitor before you shut down the machine.

RasterOps says the way around this problem is to boot from a floppy disk. I don't like this method. Here's another way. Under System 7, put an

alias of the Monitors control panel onto the desktop of the internal monitor. Also make sure that you place the Monitors control panel on the internal monitor so that it opens up there rather than on the external monitor. That way, if you travel without the external monitor, you can just open the Monitors alias, reset the menu to display on the internal monitor, and restart.

Frank Rezny
Kanata, Ontario
Canada

EndNote Plus

EndNote Plus is wonderful for keeping a list of references for a document, but it can't also keep track of figure and table numbers for a report. You can add this ability by copying the EndNote Plus application onto your hard disk. For

references, figures, and tables, you'll need two extra copies. Name the new versions EndNote B and EndNote C. These copies of EndNote Plus need to use unique characters to mark the temporary citations in your document. EndNote Plus stores these characters in a preferences file in the System Folder, so you must use ResEdit to rename the preference files the copies use. Open EndNote B in ResEdit, and open STR# resource number 128. The eighth string in this resource is the name of the preferences file. Change it from EndNote Prefs to EndNote B Prefs, and save it. Make a similar change for EndNote C.

Next, launch EndNote B and select Citation Markers from the Edit menu. Change the markers from [and] to { and }. Similarly change the citation

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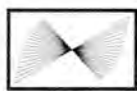
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Tips from the Experts

Quicken

Just in time for our annual travails with the IRS, Intuit's tech-support staff shares some of its secrets for getting the most out of its popular personal-finance program, Quicken.

Customizable Command Keys. Hold down the Command key when you choose a menu item that lacks a keyboard command equivalent. This action brings up a dialog box that lets you assign Command-key shortcuts. You can also use this technique to delete or change existing keyboard shortcuts.

Keyboard Navigation in Lists. When the Account, Category, Class, Memorized Transaction, or Transaction Group list is the active window, simply type the first letter or first few letters to select the desired item in that list.

Adjust Date/Check Number. You can use the + key or the - key to increase or decrease the date and/or check number by 1.

markers in EndNote C to < and >.

Now, when you're writing your document, create a reference-list file in EndNote Plus, a figure-list file in EndNote B, and a table-list file in EndNote

C. When the time comes to format your document, open your base document in one copy of EndNote and format it, open the first formatted document in the next copy of EndNote and format it, and

open the second formatted document in the third copy of EndNote and format it. You can then open the final formatted document in your word processor and move the figure list and table list to wherever you want them.

This workaround sounds quite complicated, but it's really not that bad once you start using it. The EndNote Plus application exists quite happily in a 512K MultiFinder partition, so your three copies occupy about 1.5 megabytes of memory. Obviously, you can't do this on a 1-megabyte Mac Plus, but it works well on an 8-megabyte Mac IIfx. Each additional copy of EndNote Plus occupies 321K of hard-disk space plus 5K for the preferences file.

Stephen C. Harmony
Los Alamos, NM

Disk First Aid

Disk First Aid contains a hidden command that offers more information about the program's operations. Press Command-S after opening a disk in Disk First Aid, and a scrolling field appears below the normal dialog box. This field displays a list of actions performed by Disk First Aid as they are executed.

Stephen Sayer
Ann Arbor, MI

Generic Icons

Generic icons in System 7 are left-handed for DAs but right-handed for applications. If you're a left-handed user, you can copy and paste the left-handed DA icon into other applications by using the Get Info dialog box.

Doug Baer
Bala, PA

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Don't want to wait for an answer? Post your question on ZiffNet/Mac, MacUser's online service, and get a reply from Bob, Andy, or one of the other MacUser experts. See the masthead in this issue for instructions on how to sign up.

By Bob LeVitus and Andy Ihnatko

Better Note Pad DA?

Q. I use Apple's Note Pad DA all the time, because it's quick and simple, but I'm running out of room. Is there a way to add more pages to it (maybe by using ResEdit)? Is there a shareware alternative to Note Pad?

John R. Clark
Greensboro, NC

Bob: I don't know if it's possible to add pages with ResEdit, but there's an excellent shareware notepad DA called FlashWrite II (Andrew Welch, 29 Grey Rocks Road, Wilton, CT 06897; \$15). It lets you create as many pages as you want (see Figure 1), and each

page can contain as many as 32,000 characters. Text can be shown in any font, size, or style. FlashWrite II can import and export text files, find text on any page, and count words. I know several people who swear by it.

Strife Begins at 40

Q. I partitioned my Tsunami hard disk with Silverlining, and it works great. But I have a problem: My Mac SE is slowing down, and I get the "Too many files open" dialog box when I really don't have all that many files open. (I use System 6.0.7.)

Also, when I rebuild the desktop by holding

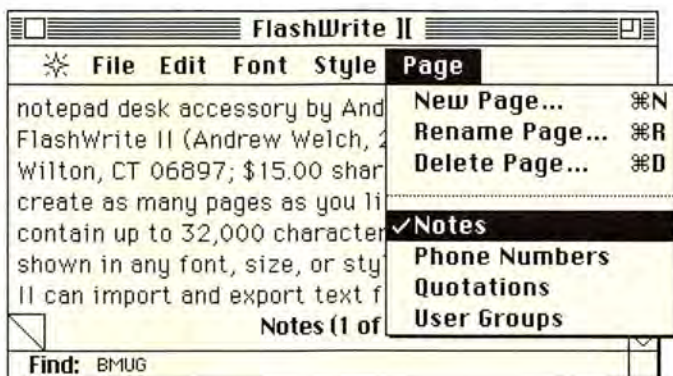


Figure 1: FlashWrite II has features you won't find in Note Pad DA.

*... But Were Afraid to Ask

Bohemian religious reformer John Huss' last words, before being burned at the stake in 1415, were these: "O holy simplicity!" Now, I'm no theological scholar, but I draw two conclusions from this. First, it's important that you send us your basic simple questions; as that brave man indicated, they're just as important as our more usual deep technical inquiries. Second, by using that quote in print, I've rendered the \$35 *Bartlett's Familiar Quotations* I just bought completely tax-deductible.

So if a simple question has been bugging you for eons but you haven't had the courage to ask it, send it on in! And lest you meet the same fate as Huss, we'll say that your question was sent in by the author of another book I'd like to write off on this year's 1040.

Q. I've read references to Macintosh Technical Notes as a source of information. What exactly are they, and how do I get my hands on them? Do I have to work for Apple or something to get them?

Bill Watterson
Scientific Progress Goes Boink!

Andy: The Technical Notes are bloody marvelous. Every time there's a topic that seems to be perplexing the developer community, Apple's DTS (Developer Technical Support) prepares a note that'll set you hip to the whole situation. When bugs are discovered in system software or in ROM code, Technical Notes that fully describe the problems and how to solve them are written

and distributed. When all programmers seem to be asking the same question about how to implement a certain feature in a program, they're referred to a Note that explains the whole nasty procedure in intimate detail. When there's no other way to distribute documentation on certain system software (such as TeachText), it's disseminated as a Technical Note.

Useful things, those Notes. They're written in a light, fun style that makes them pretty easy to digest. Get a load of some of these titles: "I Was a Teenage DMA Junkie," "Space Aliens Ate My Mouse," "Toolbox Karma," and — the wackiest of them all — "CMOS on Macintosh LC PDS" (!). Tech Notes are normally referenced by number. If you wanted a copy of a classic, essential guide to SCSI configuration, you'd ask for TN #134, not "HD Medic & Booting Camp."

The Tech Notes are not designed for mass consumption, but they're a valuable resource. DTS wants its Notes to get the widest distribution possible, so all the more than 300 notes can be downloaded from many on-line services. You can also buy them on-disk or in printed form from APDA.

Even if you don't get ahold of a copy of an actual Technical Note, they're a useful concept. The next time someone asks you a question and you haven't the foggiest, just say, "Oh, DTS put out a Technical Note on that... just give APDA a call, and ask for Note number mumble-mumble." Works like a charm.

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POWER TOOLS HELP FOLDER

down the Command and Option keys on startup, it just rebuilds the desktop for the partition that contains my System Folder. Could this be the problem? How do I go about rebuilding the desktops for the other partitions?

Don Jacobs
Pahoa, HI

Bob: You need to increase your Mac's open-file count, using either Suitcase II or MasterJuggler. The Mac's default setting is 40 files (documents, applications, font or DA suitcases, and so on). Both Suitcase II and MasterJuggler let you reset this to any value as high as 99.

When you rebuild the desktop, hold the Command and Option keys down longer. If these keys are pressed when the partition is first mounted, you should see the "Are you sure you want to rebuild the desktop" dialog box.

Andy: Yeah, holding down those keys doesn't give a global "Rebuild any and all desktops you may come across" command—it's only saying "Rebuild the desktop of whatever volume is currently being mounted." If you have catlike reflexes, you can even pounce in and slam down those keys while a specific volume's being mounted.

Now about this maximum-files-open deal. Your problem is actually underallocation of FCBs (file control blocks), which are specified in the boot blocks on your hard drive. This results in an ID -42 error. In English, this means that somewhere in the boot blocks, there's a number that indicates how many files can be open at once. The Mac checks this number at startup and allocates a fixed number of FCBs. So if a program tries to open one file more than the limit, blammo! You get the "Too many files open" dialog box (system error ID -42. Negative of the Meaning of Life... ironic, huh?). The term *files open* is a

bit misleading, however. The number of open files involves not only how many documents you're working with but also all your fonts and DAs, every single application running at the time, and all the little files those applications have open behind the scenes. Programs being as piggy as they are, 40 open files can be exceeded pretty easily.

Solution: Bump that 40-file limit up to something more studly. The programs Bob mentioned can write a new, higher Max Fileroom number to your hard disk's boot blocks, and thus you'll be safe from further ID -42s. Well, at least until you break that limit too! If you don't own either of these programs, get a copy of a freeware program from Peter Helme called Up Your FCBs. Pete has overcome the tremendous handicap of having a name that's only one letter away from that of a Joan Collins ex-husband and has written a spiffy control panel that changes the open-files ceiling as you work. If one fatal file too many is about to be opened, Up Your FCBs automatically increases the maximum number of open files so the additional file can be opened without incident. It's all done in memory rather than by writing to your boot blocks, so it's a bit safer.

Fanned Dance

Q. There's a lovely LaserWriter IINTX in our office. Is there any way to load more than one sheet at a time manually, without yanking out the entire paper tray? We often need to load four pages of blank letterhead.

Steven Schloss
Washington, DC

Andy: This isn't exactly widely known, but you can usually get a laser printer's manual feed to work with multiple pages automatically—if you master a simple technique. Fan your stack of

Depending on your printer, you should be able to reliably feed four to eight pages using this method. Don't make the stack too thick (five pages is the most I could do with an NTX), and don't overdo the fanning, because if the pages are staggered more than a couple of millimeters, they won't feed continuously.

Q. A year or so ago, I read a hint that said to type **GO FINDER** in the small window that pops up after you press the reset key that's located next to the interrupt key on most Macs. If the Mac returns to the Finder, it's supposedly possible to save an unsaved document. Out of the hundred or so times I've tried it, however, I can recall its working only once. Fortunately, that one time allowed me to reopen my document and save it.

Bob: I use a similar trick that seems to work better than **GO FINDER**. In the event of a crash or a freeze, press the interrupt key. (Technically speaking, when you press the interrupt key, you invoke the mini-, or built-in, debugger.) It usually brings up an empty dialog box that has a caret (>) prompt. If it does, try typing

The 0 in this line and the next one you'll type are both numeric zero; **<Return>** means that you should press the Return key once. Type the

Andy: If you're really determined to recover from as many crashes as possible, check out Crash Barrier (Cassady & Greene, 22734 Portola Drive, Salinas, CA 93908; [408] 484-9228, \$79.95), a nifty new control panel that replaces the normal System Error message with its own friendly dialog box. If your Mac crashes, Crash Barrier pops up instead of the bomb dialog box and gives you a chance of recovering. Although it doesn't work every time, Crash Barrier is more effective than any minidebugger voodoo I know of.

Q. I am a recently inspired programmer who writes in QuickBASIC. I'd like to move to more-capable languages, such as C or Pascal, as I become more proficient. Can one of these languages serve as a stepping stone to the other, even if they have totally different levels of complexity, or would learning them require separate training for each? Also, could you recommend a beginner's

[illegible]

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CIRCLE 183 ON READER SERVICE CARD.

program for either language?

Alex Geddie
Fonthill, Ontario
Canada

Andy: C and Pascal are the Coke and Pepsi of computer languages; almost all programmers use one or the other. Pascal is a better choice for budding programmers, for two important reasons: It's more like English, so it's easier to read, and more importantly, it forces you to take a highly structured approach to your programming.

C wasn't designed to be pretty (there's even an annual programming contest for people who like to write difficult-to-understand C code). You can write code as loose or tight as you want—C couldn't care less. Is it any wonder that C has become more popular than Pascal? I sure wouldn't

recommend it as Baby's First Programming Language, but if you already have a firm grasp of programming concepts, C isn't too threatening.

The bottom line: Take your pick. They're both big-time professional languages that can handle all your programming needs. On a Mac, the best C and Pascal packages are Symantec's THINK C and THINK Pascal, which offer (in my humble opinion) the easiest-to-use development systems for any computer. Companion products, though, may tip the scales for you one way or the other. Symantec also sells a tutorial called Just Enough Pascal, which runs alongside THINK Pascal. It provides interactive lessons on Pascal and Toolbox programming. On the other hand, if you embrace C, you can use Dave

Mark's excellent book *Learn C on the Macintosh*. It's a primo primer on C, and it has a gentle introduction to the Toolbox. The book also includes the Thin C compiler, a junior-level edition of THINK C, so you can dig in without having to buy anything else.

Once you've learned these languages, you have to enter the primeval forest known as the Macintosh Toolbox. That's the name for all the Mac's built-in functions for working with menus, windows, buttons, icons, and all the other standard elements of a Mac program. You're going to have to know the Toolbox inside and out; writing Mac software that doesn't use the Toolbox is roughly comparable to bringing a greasy sack of Big Macs to a vegetarian rally (tempting though the thought may be).

For guidance, turn to any one of Mark's wonderful *Macintosh Programming Primer* books (friendly two-volume tutorials on C or Pascal Toolbox programming) or put yet more dough into Symantec's coffers and buy THINK Reference. This is a wonderful on-line reference: You tell it what you want to do, and it describes how to do it and can even paste the proper generic code into THINK C or THINK Pascal for you.

After you've built up some self-confidence in your chosen language, start amassing volumes of *Inside Macintosh*, Apple's official reference books. These books are highly technical and weren't designed to be friendly tutorials, so I don't recommend them as your first resource, but they look darn nice on the shelf. 

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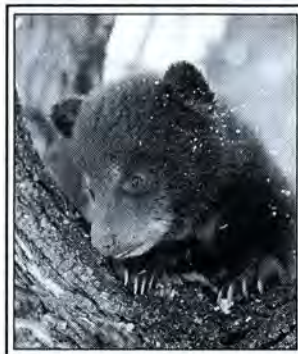
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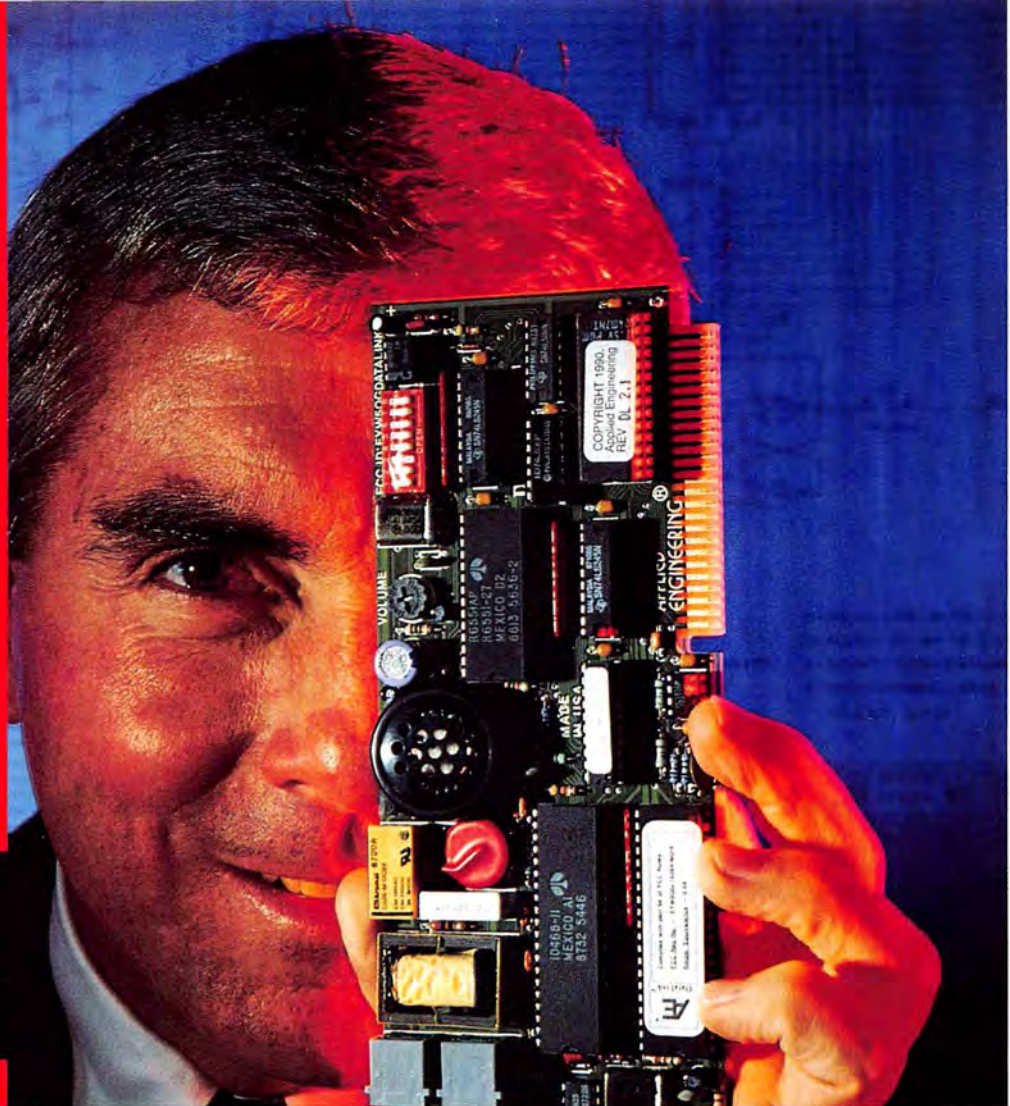
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Patrick Gallagher, VP of Sales and Marketing, Applied Engineering

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MacWeek & MacUser's 1991 Utility Product of the Year!



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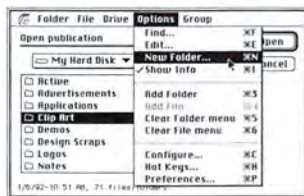
Unprecedented performance, compatibility, and value. In this case, a collection of 10 utilities that does for System 7 what products like SUM and Norton do for hard disks — only more so. As *MacUser* put it, "Now Utilities will make your Macintosh faster, easier, and more fun to use." For example:

- **StartUp Manager™** provides complete extension management
- **Super Boomerang™** finds files and folders instantly
- **WYSIWYG Menus™** groups fonts in their own typefaces
- **NowMenus™** makes the Apple Menu hierarchical
- **AlarmsClock™** displays the time & reminders in the menu bar
- **NowSave™** automatically saves files to prevent data loss
- **Screen Locker™** keeps confidential information confidential
- **MultiMaster™** launches applications and files
- **Profiler™** analyzes system configurations
- **DeskPicture™** puts color and B&W pictures on the Desktop

In fact, every utility in the collection is the best of its kind. All of the utilities in the collection are also designed, tested, and guaranteed to work together — and with anything else your customers may have...even System 6. No wonder *MacUser* gave it a perfect five mouse rating and called it "a must-have for experienced users and novices alike."

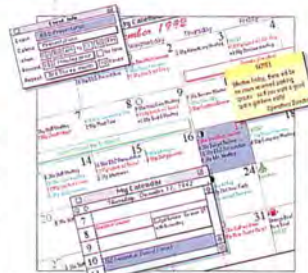


NowMenus saves you a lot of mousing around by creating submenus up to 5 levels deep for anything you put in your Apple Menu items folder — even aliases and other folders. It also pops up the menu bar whenever you click your mouse



Super Boomerang lists your most frequently used files and folders in all Open and Save dialog boxes and in the Apple menu. It also lets you find files by name or content...even if they've been compressed (a file name search on a 100MB hard disk can take only 3 seconds — without requiring an index)

MacWeek & MacUser's 1992 Network Product of the Year?



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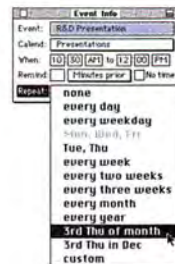
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MINIFINDERS

Welcome to MiniFinders, your personal buyer's guide. For this special edition on networking and connectivity, *MacUser* editors have carefully selected and evaluated each product, assigning ratings from one to five mice, in half-mouse increments; only previously reviewed products that have received a mouse rating appear in MiniFinders. All the ratings are relative within a category, and because the market is constantly changing, our ratings change too. For detailed product information, look for the original, full-length review in the issue cited in parentheses at the end of each MiniFinder entry. We've indicated all our Eddy (Editors' Choice) Award winners with a ★, along with the year they were recognized for their excellence. You can download the full-length product reviews from the back-issue libraries of ZiffNet/Mac (Zmac), our on-line service.

Vendor addresses, product prices, hardware specifications, and software features change quickly. To update the MiniFinders database of reviewed products, send written notification to MiniFinders, c/o *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

NETWORKING & CONNECTIVITY

3Com EtherLink/NB 11111/2

This NuBus Ethernet card offers average performance. Version 1.1 reviewed. Requires NuBus-capable Mac. \$595. 3Com, 3165 Kifer Rd., Santa Clara, CA 95052. (800) 638-3266 or (408) 764-5000. (June '90)

3Com EtherLink/SE 11111

This Ethernet interface has very fast SE client, server, and raw performance. Version 1.0 reviewed. Requires Mac SE. \$595. 3Com, 3165 Kifer Rd., Santa Clara, CA 95052. (800) 638-3266 or (408) 764-5000. (June '90)

AccessPC 11111/2

AccessPC is an INIT that lets the Mac desktop mount DOS and Mac floppy disks, as well as PC-compatible removable cartridges with higher capacities. Assigns Macintosh Type and Creator codes to MS-DOS files, which lets specified Mac applications open them automatically without going through the Apple File Exchange utility. Works with DOS floppy drives from Apple, PLI, and Kennet. Includes universal Multi-Driver (an INIT and control panel) to help with PC drives that have trouble mounting on the Mac desktop. Works well in combination with Insignia Solutions' SoftPC running PC applications on a Mac hard-disk drive. Version 1.1 reviewed. Requires any Mac with FDHD SuperDrive or external DOS floppy drive or removable-cartridge drive. \$99. Insignia Solutions, 526 Clyde Ave., Mountain View, CA 94043. (415)

694-7600. (Aug '91)

AlisaTalk 1111

AlisaTalk, a file server for networked Macs, provides numerous features for VAX, DOS, and Mac interoperability. Slow for AFP file sharing and requires knowledge of VMS. Version 3.3 reviewed. Requires VAX. 10-user license, \$1,500; license for unlimited users, \$4,700. Alisa Systems, 221 E. Walnut St., Ste. 175, Pasadena, CA 91101. (818) 792-9474. (June '91)

Apple EtherTalk NB Card 11111

An excellent performer in file-transfer tests. Has 3Com hardware. Good raw performance. Requires NuBus. \$424. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (June '90)

AppleShare 11111/2

AppleShare is inexpensive file-server software from Apple. Fast, and easy to configure and administer. Lets network users protect files from other users at the folder level. Permits setup and administration from Macintosh, provides choice of LocalTalk or Ethernet connection, and supports AppleShare-PC. Version reviewed did not support VAX clients and allowed maximum of 50 simultaneous users. Version 2.0 reviewed. Version 3.0 shipping. Requires a dedicated Mac Plus or later and a hard-disk drive. \$799. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Nov '91)

AppleTalk Internet Router 11111/2

This software router can create a large internet with EtherTalk and TokenTalk. Doesn't support dial-in access, but offers support for AppleTalk Phase 2, mixed Phase 1 and Phase 2, and token-ring networks. Cabling can be thick coaxial, thin coaxial, or twisted-pair. Quality of technical support depends heavily on locating a knowledgeable Apple dealer. Version 2.0 reviewed. \$399. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Apr '91)

APT Communications

ComTalk 1111

This EtherTalk/LocalTalk router is a speed demon, available in the widest variety of configurations and prices. APT Internet Manager 5.0 software is powerful but hard to understand. Router code is in upgradable ROM, and the CPU is a Motorola 68000. Can handle as many as six LocalTalk networks but only one EtherTalk network. Offers support for AppleTalk Phase 2 or mixed Phase 1 and Phase 2. Version ComTalk HX shipping. \$7,000 with one Ethernet and six LocalTalk ports; other configurations, \$3,000 to \$9,000. APT Communications, Inc., 9607 Dr. Perry Rd., Ijamsville, MD 21754. (301) 831-1182. (Apr '91)

Asanté MacCon+ 30i ET 11111/2

This PDS card offers 10BASE-T Ethernet networking capability. Has thicknet AUI port, diagnostic software, and link-integrity LED. Doesn't auto-configure. Five-year warranty. Requires Mac SE/30 or IISI. \$299. Asanté Technologies, Inc., 404 Tasman Dr., Sunnyvale, CA 94089. (800) 662-9686 or (408) 752-8388. (Sept '91)

Asanté MacCon+ IIET 11111/2

This NuBus card provides 10BASE-T Ethernet networking capability. Includes thicknet AUI port, diagnostic software, and link-integrity LED. Doesn't auto-configure. Five-year warranty. Requires Mac II series. \$299. Asanté Technologies, Inc., 404 Tasman Dr., Sunnyvale, CA 94089. (800) 662-9686 or (408) 752-8388. (Sept '91)

Asanté MacCon+ LC 11111

MacCon+ LC is a PDS card that provides 10BASE-T Ethernet networking capability. Includes BNC port, diagnostic software, and link-integrity LED. Auto-configuring. FPU socket on board. Five-year warranty. Requires Mac LC. \$379. Asanté Technologies, Inc., 404 Tasman Dr., Sunnyvale, CA 94089. (800) 662-9686 or (408) 752-8388. (Sept '91)

Asanté MacCon+ SE 30iE 11111/2

This Ethernet device in an SE/30 is a good choice for use in an SE/30 or IISI acting as a file server. Formerly called MacCon+ SE 30iE. Fast raw performance. \$299. Asanté Technologies, Inc., 404 Tasman Dr., Sunnyvale, CA 94089. (800) 662-9686 or (408) 752-8388. (June '90)

Asanté MacCon+ SE/E 11111

This inexpensive Ethernet device provides very good performance. Requires Mac SE. \$299. Asanté Technologies, Inc., 404 Tasman Dr., Sunnyvale, CA 94089. (800) 662-9686 or (408) 752-8388. (June '90)

Aspects 11111

Aspects is the first real groupware product for the Mac. As with multiuser databases, Aspects provides several users with simultaneous access to multiple documents (limited by available RAM). Word-processing, drawing, and painting modes are provided, but there's no database or spreadsheet mode, outline, or color support. Operates on LocalTalk, Ethernet, or token-ring networks via AppleTalk or can use 2,400-bps modems. Version 1.0 reviewed. Version 1.02 shipping. Requires Mac Plus or later; hard-disk drive recommended. Per user, \$299; 5 users, \$895; 10 users, \$1,295; educational discounts available. Group Technologies, 1408 N. Fillmore St., Ste. 10, Arlington, VA 22201. (800) 476-8781 or (703) 528-1555. (June '91) ★ '90 Eddy

Avatar LanWay E-10T Direct Slot 11111

The LanWay E-10T Direct Slot is a PDS card that offers 10BASE-T Ethernet networking capability. Has thicknet AUI port and link-integrity LED, but no diagnostic software. Auto-configuring. Requires Mac SE/30. \$425. Avatar Corp. (Tri-Data Div.), 3270 Scott Blvd., Santa Clara, CA 95054. (408) 727-3270. (Sept '91)

Avatar LanWay E-10T NuBus 1111

The LanWay E-10T NuBus is a NuBus card that provides 10BASE-T Ethernet networking capability. Includes thicknet AUI port and link-integrity LED. Lacks diagnostic software. Auto-configuring. Skippy manual. Requires Mac II series. \$345. Avatar Corp. (Tri-Data Div.), 3270 Scott Blvd., Santa Clara, CA 95054. (408) 727-3270. (Sept '91)

Cabletron E5000 11111/2

This Ethernet device is a good choice for use in an SE/30 acting as a file server. Optional fiber-optics transceiver. \$699 to \$949, depending on configuration.

MICE RATINGS 1 1 1/2 2 2 1/2 3 3 1/2 4 4 1/2 5 5 1/2 5 1/2

MINIFINDERS

Cabletron Systems, 35 Industrial Way, P.O. Box 6257, Rochester, NH 03867. (603) 332-9400. (June '90)

Cabletron E6000 \$\$\$

This Ethernet interface offers excellent performance. Difficult to switch cable types. Has fiber-optic option. Requires NuBus-capable Mac. \$699 to \$949, depending on configuration. Cabletron Systems, 35 Industrial Way, P.O. Box 6257, Rochester, NH 03867. (603) 332-9400. (June '90)

Cabletron Systems E6010 DNI \$\$\$

The E6010 DNI is a NuBus card that provides IOBASE-T Ethernet networking capability. Includes thicknet AUI port, excellent diagnostic software, and link-integrity LED. Doesn't auto-configure. Good manual. Requires Mac II series. \$699. Cabletron Systems, 35 Industrial Way, P.O. Box 6257, Rochester, NH 03867. (603) 332-9400. (Sept '91)

Carbon Copy/Mac \$\$\$

This screen-sharing program lets you access another networked Mac for technical support, training, or file management. A guest Mac can control only one host Mac, but multiple guests can observe a host. Supports network as well as modem connections in the same package. Can transfer files among Macs. Provides the security feature of assigning different "classes" of users. Not color-capable. Version 2.0 reviewed. Single user, \$99; per AppleTalk zone, \$299. Microcom, Inc., 500 River Ridge Dr., Norwood, MA 02062. (800) 822-8224 or (617) 551-1000. (Dec '91)

Cayman GatorBox \$\$\$

This EtherTalk/LocalTalk hardware router offers many gateway features, including TCP/IP connectivity. No battery backup. Supports AppleTalk Phase 2, mixed Phase 1 and 2 networks, SNMP and other protocols, but only one LocalTalk port is provided. Network-security features provide configuration protection and resource hiding, including zone, printer, and device filtering. Good setup information. With optional GatorShare software, a UNIX host looks like an AppleShare server. Unlimited free technical support. \$2,795; GatorShare software, \$1,995. Cayman Systems, 26 Landsdowne St., Cambridge, MA 02139. (617) 494-1999. (Apr '91)

Cayman GatorCard E/I \$\$\$

This Ethernet interface is very fast. Employs top-notch Racal Inter-Lan hardware. Requires NuBus-capable Mac. \$449. Cayman Systems, 26 Landsdowne St., Cambridge, MA 02139. (617) 494-1999. (June '90)

cc:Mail Mac \$\$\$

cc:Mail is an E-mail application featuring keyboard loading of

recipient names, message prioritizing, multiple enclosures, return receipts, reply and forwarding, storage folders, and archiving. Good interface. PC-to-Mac VGA-graphics-display translation. Requires PC for setup, administration, and server-to-server traffic. No DA for messaging. Sends messages to multiple recipients slowly. Allows as many as 20 file enclosures and as many as 65,000 users per server. Version 1.22 reviewed. Requires Mac Plus or later, System 6.03 or later, and AppleShare server. Platform Pack, \$495; 8 users, \$195; 25 users, \$595. cc:Mail, 2141 Landings Dr., Mountain View, CA 94043. (800) 448-2500 or (415) 961-8800. (Mar '92)

Compatible Systems EtherRoute \$\$\$

This hardware EtherTalk/LocalTalk router is easy to set up and use. Offers fast, solid performance. Current software is EtherRoute Manager 1.7.0. Router code is in upgradable ROM, and CPU is an 80C188. Can handle no more than two LocalTalk networks and only one EtherTalk network. Offers support for AppleTalk Phase 2 or mixed Phase 1 and Phase 2. Difficult to change cabling-type switch. Lacks TCP/IP support but an EtherRoute/TCP version is also available. Unlimited, free technical support. \$1,495. Compatible Systems Corp., P.O. Box 17220, Boulder, CO 80308. (800) 356-0283 or (303) 444-9532. (Apr '91)

Compatible Systems Ether2 TP \$\$\$

This is a NuBus card that provides IOBASE-T Ethernet networking capability. Includes thicknet AUI port, diagnostic software, and link-integrity LED. Doesn't auto-configure. Requires Mac II series. \$295. Compatible Systems Corp., P.O. Box 17220, Boulder, CO 80308. (800) 356-0283 or (303) 444-9532. (Sept '91)

DAL (Data Access Language) \$\$\$

DAL is an API (application-programming interface) for sophisticated client/server database access. Server operating systems include IBM MVS and VM as well as VAX/VMS. Database-management systems include DB2, Ingres, Oracle, Rdb/VMS, SQL/DS, Sybase, Informix, and IBM MVS and VM. Offers server independence but is slower than Oracle's SQL*Net or TechGenosis' Sequelink. Version 1.2 shipping. Free with System 7.0; Client Toolkit, \$695; server, \$5,000 to \$20,000. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Jan '91)

DataClub Classic \$\$\$

DataClub is distributed-file-server software with the look and feel of

a dedicated AppleShare server. Requires an AppleTalk Phase 1 network or Phase 2 with only a router present. Lets users combine folders from different Macs into one logical volume and move folders of data among Macs without changing the appearance of the combined volume. Can support as many as 76 users, each using a control panel to manage access. System-7-savvy. Incomplete manual. Version 1.1.1 reviewed. Version 2.0 shipping. Requires Mac Plus or later with at least 2 MB of RAM and System 6.03 or later. \$175; 3-user package, \$395; 10-user package, \$795. International Business Software, 1270 Oakmead Pkwy., Ste. 314, Sunnyvale, CA 94086. (800) 733-2822 or (408) 522-8000. (Sept '91)

David Systems Ether-T Mac \$\$\$

This NuBus card provides IOBASE-T Ethernet networking capability. Lacks thicknet AUI port, diagnostic software, and link-integrity LED. Two-year warranty. Requires Mac II series. \$350. David Systems, Inc., 701 E. Evelyn Ave., Sunnyvale, CA 94086. (408) 720-6867. (Sept '91)

Dayna DaynaPORT E/I-IT \$\$\$

The DaynaPORT E/I-IT is a NuBus card that provides IOBASE-T Ethernet networking capability. Includes thicknet AUI port, limited diagnostic software, and link-integrity LED. Doesn't auto-configure. Lifetime warranty. Requires Mac II series and System 6.03 or later. \$299. Dayna Communications, Inc., 50 S. Main St., Salt Lake City, UT 84144. (801) 531-0600. (Sept '91)

Dayna DaynaPORT E/LC-IT \$\$\$

This PDS card offers IOBASE-T Ethernet networking capability. Lacks additional ports. Comes with diagnostic software and link-integrity LED. FPU socket on board. Lifetime warranty. Requires Mac LC. \$299; with math coprocessor, \$449. Dayna Communications, Inc., 50 S. Main St., Salt Lake City, UT 84144. (801) 531-0600. (Sept '91)

Dove FastNet SE \$\$\$

This Ethernet interface has average performance. Good diagnostics. Version 2.2 shipping. Requires Mac SE. \$299. Dove Computer Corp., 1200 N. 23rd St., Wilmington, NC 28405. (800) 788-3683 or (919) 763-7918. (June '90)

EMAC Speedlink II \$\$\$

This NuBus Ethernet card has average performance. Good software. Version "E" hardware, 2.6 software shipping. Requires NuBus-capable Mac and System 6.03 or later. \$449. EMAC (Everex Systems), 48431 Milmont Dr., Fremont, CA 94538. (800) 628-

3837 or (510) 498-1111. (June '90)

EMAC SpeedLink/II TP \$\$\$

This NuBus card has IOBASE-T Ethernet networking capability. Includes thicknet AUI port, NCSA Telnet, diagnostic software, link-integrity LED, and auto-configuration. Two-year warranty. Version "E" hardware, 2.6 software shipping. Requires NuBus-capable Mac and System 6.03 or later. \$449. EMAC (Everex Systems), 48431 Milmont Dr., Fremont, CA 94538. (800) 628-3837 or (510) 498-1111. (Sept '91)

EMAC SpeedLink/SE30 TP \$\$\$

The SpeedLink/SE30 TP is a PDS card that provides IOBASE-T Ethernet networking capability. Includes thicknet AUI port, diagnostic software, and link-integrity LED. Auto-configuring. Confusing manual. Two-year warranty. Version "E" hardware, 2.6 software shipping. Requires Mac SE/30 and System 6.03 or later. \$449. EMAC (Everex Systems), 48431 Milmont Dr., Fremont, CA 94538. (800) 628-3837 or (510) 498-1111. (Sept '91)

Engage SynchRouter/LTI \$\$\$

This hardware/software router combination is fast and simple to use. Provides limited statistics on router traffic and has no automatic backup link. Supports LocalTalk and dial-up asynchronous links as well as synchronous DDS (Digital Data Service), ISDN, and T1 links. Maximum speed is 500 Kbps. Interfaces include RS-232, RS-449, and V.35 but not EtherTalk. \$2,495. Engage Communication, Inc., 9053 Soquel Dr., Ste. 201, Aptos, CA 95003. (408) 688-1021. (Jan '92)

EtherPeek \$\$\$

This network-protocol-analyzer software can create simulated network traffic for analysis and has many useful features. Modular design adapts well to new Ethernet cards and protocols, but performance suffers, because of complex application design. Features include sophisticated use of filters, triggers, and alarms. Supports AppleTalk, ARP, SNMP, IPX, DECnet, XNS, and IP/Talk protocols. Version 1.04 reviewed. \$795. AG Group, 2540 Camino Diablo, Walnut Creek, CA 94596. (510) 937-7900. (Feb '92)

Farallon PhoneNET (Mac II) Card for Ethernet \$\$\$

This NuBus card provides IOBASE-T Ethernet networking capability. Includes thicknet AUI port and link-integrity LED. Lacks diagnostic software. Auto-configuring. Requires Mac II series. \$249; 10-user pack, \$2,440. Farallon Computing, Inc., 2000 Powell St., Ste. 600, Emeryville, CA 94608. (510) 596-9000. (Sept '91)

MICE RATINGS \$ \$½ \$\$\$ \$\$\$½ \$\$\$\$ \$\$\$\$½ \$\$\$\$\$ \$\$\$\$\$½ \$\$\$\$\$\$

Farallon PhoneNET (SE/30) Card for Ethernet

The PhoneNET (SE/30) Card for Ethernet is a PDS card that provides 10BASE-T Ethernet networking capability. Includes thicknet AUI port and link-integrity LED. Lacks diagnostic software. Auto-configuring. Requires Mac SE/30. \$249; 10-user pack, \$2,440. Farallon Computing, Inc., 2000 Powell St., Ste. 600, Emeryville, CA 94608. (510) 596-9000. (Sept '91)

Flash

Flash is a DA/INIT combination that transfers files in the background, with or without MultiFinder. Uses Finder folders to send and receive files. Has chat capability. Also lets you create a group folder, which sends copies of a file to everyone in a group. Setting its many options is unnecessarily complex. Good performance. Version 1.0 reviewed. Version 1.1 shipping. \$199.95 per zone. Beagle Bros, 6215 Ferris Sq., Ste. 100, San Diego, CA 92121. (619) 452-5500. (Sept '90)

GraceLAN

GraceLAN is network-management software that collects detailed information about connected Macs. Can also discern hardware and software configuration of DOS-compatible PCs on the network. Can draw network diagram but has no internal database manager. Version 2.0 reviewed. 50 users, \$495; 200 or more users, \$1,195. Technology Works, 4030 Braker Ln. W., Austin, TX 78759. (800) 688-7466 or (512) 794-8533. (Oct '91)

InBox Plus

This E-mail system runs on any HFS-compliant file server. Servers can be Macs, PCs, Sun workstations, VAXes, or other platforms. Supports AppleShare, NetWare, 3+, LAN Manager, and SitkaTOPS. Clients can be Macs or PCs. There are only Memo and Phone message forms. Supports mailboxes, groups, passwords, and storage boxes, but user-customizable features are very limited. Messages are sorted by subject, sender, status, or date. Excellent manual. Allows unlimited number of file enclosures. Maximum number of users per server is 250. Version 3.0G reviewed. Requires Mac Plus or later and System 4.2 or later. Up to 50 users, \$995; up to 100 users, \$1,995; up to 250 users, \$5,995. Sitka Corp., 950 Marina Village Pkwy., Alameda, CA 94501. (800) 445-8677 or (510) 769-9669. (Mar '92) ★ '86 Eddy

InterPoll

This simple, reliable network-administration tool is suitable for small LocalTalk networks (5 to 20 nodes). Doesn't support EtherTalk but can create simulated network traffic for analysis. Has

excellent manual. No support for filters, charts, or error management. \$129. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. (800) 776-2333 or (408) 996-1010. (Feb '92)

LapLink Mac III

LapLink Mac III is a Mac-to-DOS and Mac-to-Mac file-transfer program that lets you have control from either computer. Version 3.0 has a revised interface. Uses a special cable to provide 750-Kbps transfer. It has an INIT that gives you background access to a remote Mac's files even when LapLink isn't running. You can protect the Mac globally for read/write or read-only access. Directory sort-and-search capability is provided, along with display filters to show and hide files. Version 3.0 reviewed. Version 3.2 shipping. Requires Mac Plus or later and System 5.0 or later. \$149.95. Traveling Software, Inc., 18702 North Creek Pkwy., Bothell, WA 98011. (800) 343-8080 or (206) 483-8088. (Sept '90)

LocalPeek

This network-protocol-analyzer software can create simulated network traffic for analysis and has many useful features. Supports AppleTalk and SNMP. Features include use of filters, triggers, and alarms. Suitable for novices willing to learn basic protocol analysis. Version 1.01 reviewed. \$495. AG Group, 2540 Camino Diablo, Walnut Creek, CA 94596. (510) 937-7900. (Feb '92)

LocalSwitch

This 16-port packet-switching LocalTalk hub can't match Ethernet speed but provides a significant performance boost for small, busy AppleTalk networks. Unlike a LocalTalk router, doesn't create a new zone to isolate some network traffic. Can be a cost-effective alternative to a Ethernet network and its required hardware. Best suited to networks with nodes sharing resources or easily localized traffic. May not help with heavy file transfer or file-server performance. Version 1.05 of SwitchMonitor software reviewed. \$3,495; optional patch panel, \$395. Tribe Computer Works, 1195 Park Ave., Ste. 211, Emeryville, CA 94608. (510) 547-3874. (Dec '91)

LRU Systems Nodem

The Nodem is a SCSI adapter that provides 10BASE-T Ethernet networking capability. Lacks additional ports or diagnostic software. Has link-integrity LED. Can be connected anywhere in a SCSI chain. Requires Mac SE or later. \$495. LRU Systems, Inc., 4 Shattuck Ave., San Carlos, CA 94070. (415) 594-9697. (Sept '91)

MacProducts Magic EtherNet II/10T

This NuBus card provides 10BASE-T Ethernet networking

capability. Includes thicknet AUI port. Lacks diagnostic software and link-integrity LED. Doesn't auto-configure. Lifetime warranty. Requires Mac II series. \$199. MacProducts USA, Inc., 8303 Mopac Expy., Ste. 218, Austin, TX 78759. (800) 622-3475 or (512) 343-9441. (Sept '91)

MacTOPS

MacTOPS is file-server software designed to network Macs to other computer platforms. Slow for large networks but supports communication with DOS-compatibles and UNIX machines. Files and subdirectories are accessed transparently as if they were Mac folders. MacTOPS handles file translation among platforms. Print spooling and InBox E-mail software are bundled. Serialized. Supports AppleTalk, FlashTalk, EtherTalk, and TokenTalk. Unlimited number of simultaneous users. Not AFP-compliant. Version 3.0 reviewed. Version 3.1 shipping. Requires Mac Plus or later and System 6.0.3 or later. \$299 per node; 3-user pack, \$399; no site license available. Sitka Corp., 950 Marina Village Pkwy., Alameda, CA 94501. (800) 445-8677 or (510) 769-9669. (June '91) ★ '87 Eddy

MacWorkStation

MacWorkStation is a development environment. It is also a communications program that accesses custom mainframe applications through the Mac interface. Modular design allows expansion. Mac II and MultiFinder friendly. Version 3.0 reviewed. Single-user license, \$100; site licenses available. Apple Software Licensing, 20525 Mariani Ave., Cupertino, CA 95014. (408) 974-4667. (Oct '88)

Magnalink 3000 CB

This hardware bridge is fast, offers excellent data-compression capability, and provides comprehensive diagnostics. Provides automatic secondary dial-up. No LocalTalk interface. Allows dial-up asynchronous link and supports synchronous DDS (digital data service), ISDN, and T1 links. Maximum speed is 2.048 Mbps. Supports RS-232, RS-449, V.35, and EtherTalk interfaces. \$7,900. Magnalink Communications, 63 Nahatan St., Norwood, MA 02062. (617) 255-9400. (Jan '92)

Microsoft Mail

This E-mail system offers excellent server architecture and performance. Its efficient single-instance storage scheme is used for messages (each with unlimited number of enclosed images, text files, or sounds) to multiple addresses. Offers dial-in remote access and gateways to remote sites. Third-party products can also add links to QuickMail, VAX mini-computers, WANs, and MCI Mail. Features include image-display

and voice-mail support plus interapplication communication with Excel and Word. Clean, easily customized, no-frills interface. Simple to install, maintain, and use. Can't retrieve previously sent messages. Version 3.0 reviewed. Server and each user require Mac Plus or later with hard-disk drive and System 6.0.3 or later. Mail Server software, \$395; 5 users, \$395; 20 users, \$1,349; 100 users, \$5,500. Microsoft Corp., One Microsoft Way, Redmond, WA 98052. (800) 426-9400 or (206) 882-8080. (Mar '92) ★ '87 Eddy

National Semiconductor

EtherNODE-16 NB-T

The EtherNODE-16 NB-T is a NuBus card that has 10BASE-T Ethernet networking capability. Includes thicknet AUI port and good diagnostic software. Lacks link-integrity LED. Doesn't auto-configure. Excellent manual. Five-year warranty. Requires Mac II series. \$399. National Semiconductor, 2900 Semiconductor Dr., P.O. Box 58090, Santa Clara, CA 95052. (800) 538-8510 or (408) 721-5020. (Sept '91)

National Semiconductor

EtherNODE-32 SE/30-T

This PDS card offers 10BASE-T Ethernet networking capability. Includes thicknet AUI port and diagnostic software. Lacks link-integrity LED. Doesn't auto-configure, and installer is outdated. Excellent networking tutorial and manual. Five-year warranty. Requires Mac SE/30. \$449. National Semiconductor, 2900 Semiconductor Dr., P.O. Box 58090, Santa Clara, CA 95052. (800) 538-8510 or (408) 721-5020. (Sept '91)

NetMinder Ethernet

This network-protocol-analyzer software has an intuitive, clean interface and excellent on-line help. Can't create simulated network traffic for analysis, and doesn't support cut-and-paste. Features include use of filters, triggers, and threshold alarms. Supports AppleTalk, TCP/IP, NetWare, XNS, DECnet, Bridge/3Com protocols. Version 1.2 reviewed. \$495. Neon Software, Inc., 1009 Oak Hill Rd., Ste. 203, Lafayette, CA 94549. (510) 283-9771. (Feb '92)

NetMinder LocalTalk

This network-protocol-analyzer software has an intuitive, clean interface and excellent on-line help. Can't create simulated network traffic for analysis and doesn't support SNMP. Features include use of filters, triggers, and threshold alarms. Supports AppleTalk protocols only. Version 1.0 reviewed. \$395. Neon Software, Inc., 1009 Oak Hill Rd., Ste. 203, Lafayette, CA 94549. (510) 283-9771. (Feb '92)

NetWare for Macintosh NetWare for Macintosh lets Macs

MINIFINDERS

on LocalTalk or Ethernet networks connect to a NetWare file server, using AppleShare client software. Difficult PC-based setup and administration. Extremely fast performance. Provides connectivity to DOS, OS/2, Windows, and UNIX platforms. Expensive and not recommended for small Mac-only networks but excellent for Mac users needing access to non-AppleTalk PC networks already attached to NetWare servers. Maximum number of simultaneous Mac clients is 100 (out of 250 clients). Has powerful data-security features. Version 3.0 reviewed. Requires 80386- or 80486-based PC for server, another PC for administration, and Network 3.11 file-server software. 20 users, \$895; 100 users, \$1,995; NetWare 3.11, \$3,495 for 20 users, \$6,995 for 100 users. Novell, Inc., 122 E. 1700 S., Provo, UT 84606. (800) 453-1267 or (801) 429-7000. (Nov '91) ★ '88 Eddy

Network Resources

Mac1000TP \$\$\$

The Mac 1000TP is a NuBus card that provides 10BASE-T Ethernet networking capability. Lacks additional ports or diagnostic software. Includes link-integrity LED. Three-year warranty. Version 2.3 Installer software shipping. Requires Mac II series. \$295. Network Resources Corp. (NRC), 736 S. Hill View Dr., Milpitas, CA 95035. (408) 263-8100. (Sept '91)

Network SuperVisor \$\$\$½

Network SuperVisor is network-management software that collects detailed information about connected Macs. Slow performance and complex interface but has beefy internal database manager with sophisticated analytical capabilities. Can't discern configuration of DOS-compatible PCs on the network. Version 1.0.6 reviewed. 25 users, \$495; 50 users, \$795; unlimited users, \$1,295. CSG Technologies, 530 William Penn Pl., Ste. 329, Pittsburgh, PA 15219. (412) 471-7170. (Oct '91)

NuvoLink SC \$\$\$½

Very good SCSI-adaptor client performance for an Ethernet interface. Requires Mac Plus or later. \$495. Nuvotech, Inc., 2015 Bridgeway, Sausalito, CA 94965. (800) 468-8683 or (415) 331-7815. (June '90)

Nuvotech NuvoLink II-T \$\$\$

This NuBus card provides 10BASE-T Ethernet networking capability. Includes thicknet AUI port and link-integrity LED. Lacks diagnostic software. Doesn't auto-configure. Five-year warranty. Requires Mac II series. \$395. Nuvotech, Inc., 2015 Bridgeway, Sausalito, CA 94965. (800) 468-8683 or (415) 331-7815. (Sept '91)

Nuvotech NuvoLink SC-T \$\$\$½

The NuvoLink SC-T is a SCSI adapter that provides 10BASE-T

Ethernet networking capability. Includes thicknet AUI port, diagnostic software, and link-integrity LED. Doesn't auto-configure. Must be at the end of SCSI chain. Five-year warranty. Requires Mac SE or later. \$549. Nuvotech, Inc., 2015 Bridgeway, Sausalito, CA 94965. (800) 468-8683 or (415) 331-7815. (Sept '91)

Oracle for Macintosh \$\$\$

Oracle for Macintosh is more a development tool kit than an end-user product. It allows the creation of powerful front-end Mac applications that can access Oracle databases on mainframes and minicomputers. Includes HyperCard XCMDs. Version 1.1 reviewed. Version 2.0 shipping. Requires Mac Plus or later with 2 MB of RAM, System 6.03 or later, and a hard disk with 5 MB of free space. NetworkStation version requires SQL*Net for Macintosh (\$299). Single-user version, \$299; NetworkStation version, \$299; database version, \$699. Oracle Corp., 500 Oracle Pkwy., Redwood Shores, CA 94065. (800) 345-3267 or (415) 506-7000. (June '89)

PacerShare \$\$\$½

A file server for networked Macs, PacerShare was the fastest among VAX servers we tested. Extra functionality comes at a high price. Maximum number of simultaneous users is 500. Supports Ethernet but not LocalTalk. Requires VAX. 10 users, \$2,100; 20 users, \$3,750. Pacer Software, 7911 Herschel Ave., Ste. 402, La Jolla, CA 92037. (619) 454-0565. (June '91)

Pathworks for Macintosh \$\$\$

Pathworks, a file server for networked Macs, offers self-installing, extensive VAX connectivity. Slow for AFP file sharing and crashed when 20 clients were connected (in our tests), although the number of simultaneous users is theoretically unlimited. Bundled with Mail for Macintosh, MacTerminal 3.0, and MacX. Supports Ethernet but not LocalTalk. Can't be administered from a Mac. Version 1.0 reviewed. Requires VAX. Client license, \$308; media and documentation, \$493. Digital Equipment Corp., 146 Main St., Maynard, MA 01754. (508) 493-5111. (June '91)

pcMACTERM II \$\$\$

pcMACTERM II lets your Mac take control of a DOS machine from your keyboard. Allows DOS files to be printed through the Mac. Version 1.1 reviewed. Version 3.11c shipping. Requires Mac Plus or later (with System 6.0.3 or later and printer) and PC with DOS 2.0 or later and at least 256K of RAM. \$179 for pcMACTERM II; \$395 for pcMACTERM/Network. Dynamic Microprocessor Associates (DMA), 1776 E. Jericho Turnpike, Huntington, NY 11743.

(516) 462-0440. (Jan '89)

PhoneNET Connector Series 300 \$\$\$

PhoneNET is an AppleTalk-compatible network that can extend up to 3,000 feet. Unused pre-installed phone cabling can be used for the network. \$59.95 per node; 10-user pack, \$395. Farallon Computing, Inc., 2000 Powell St., Ste. 600, Emeryville, CA 94608. (510) 596-9000. (Dec '86) ★ '87 Eddy

PhoneNET Liaison \$\$\$

This software-only WAN router can double as a local router. Slower than a hardware router (speed is limited by modem). Easy installation plus dial-up and leased-voice-line capabilities. Can create a large internet with EtherTalk and TokenTalk, using third-party cards. Offers support for AppleTalk Phase 2, mixed Phase I and Phase 2, and token-ring networks. Cabling can be thick coaxial, thin coaxial, or twisted-pair. Excellent technical support. Worth considering if you already have a dedicated AppleShare server or local and remote routers. Version 3.01 reviewed. \$395. Farallon Computing, Inc., 2000 Powell St., Ste. 600, Emeryville, CA 94608. (510) 596-9000. (Jan '92) ★ '88 Eddy

PhoneNET StarController Series 300 \$\$\$½

The StarController distributes AppleTalk signals to devices on a network and provides network-management and troubleshooting capabilities. It's very reliable, with excellent documentation and technical support. Requires PhoneNET StarController wiring kit. \$1,295. Farallon Computing, Inc., 2000 Powell St., Ste. 600, Emeryville, CA 94608. (510) 596-9000. (May '90)

QuickMail \$\$\$½

QuickMail is an E-mail package with many superior features. Macs and PCs can be used as clients. New simplified addressing scheme boosts performance in a busy environment and saves disk space on server. Supports voice-mail and real-time conferencing. Has powerful user tools and customizable message forms. Highly configurable by network manager but slightly temperamental on large, heavily used networks. Maximum number of file enclosures is 16, and maximum number of users per server is 3,200. Version 2.5 reviewed. Requires Mac Plus or later and System 6.0.3 or later. 5 users, \$399; 10 users, \$599; 50 users, \$2,499; 100 users, \$4,699. CE Software, Inc., 1801 Industrial Cir., P.O. Box 65580, West Des Moines, IA 50265. (800) 523-7638 or (515) 224-1995. (Mar '92)

QuickShare 2.0 \$\$\$½

QuickShare 2.0 (formerly sold by Compatible Systems) connects your Macintosh to a PC via SCSI,

enabling the Mac to access files on a PC or a PC network. File-transfer software provides generic text and graphic translations. Version 2.0 reviewed. Requires DOS 3.0 or later. \$695. SeeColor Corp., 34004 16th Ave. S., Federal Way, WA 98003. (206) 874-9080. (Oct '89)

Racal InterLan MacConnect \$\$\$½

This Ethernet interface card is fast. Lacks diagnostic software. Requires NuBus-capable Mac. \$495. Racal InterLan, 155 Swanson Rd., Boxborough, MA 01719. (800) 526-8255 or (508) 263-9929. (June '90)

Racal InterLan MacConnect NIA310-10BT \$\$\$½

This NuBus card provides 10BASE-T Ethernet networking capability. Lacks additional ports. Includes diagnostic software and link-integrity LED. Lifetime warranty. Requires Mac II series. \$495. Racal InterLan, 155 Swanson Rd., Boxborough, MA 01719. (800) 526-8255 or (508) 263-9929. (Sept '91)

Radar \$\$\$

Radar is network-management software that collects detailed information about connected Macs. Offers rapid performance and has a good interface. Has built-in printer utility but no internal database manager. Doesn't discern applications or DOS-compatible PCs on the network. Version 1.0 reviewed. Unlimited users. \$499. Sonic Systems, Inc., 21211 Rainbow Dr., Cupertino, CA 95014. (408) 725-1400. (Oct '91)

Send Express \$\$\$

Send Express is a DA/INIT combination that sends files or Clipboard contents in the background, with or without MultiFinder. Extremely smooth background operation compensates for sluggish performance. User interface is too complex for those who need to transfer files frequently. Version 1.0 reviewed. Version 2.1 shipping. Requires Mac Plus or later and System 6.03 or later. 3 users, \$79; unlimited users per zone, \$179. Gizmo Technologies, P.O. Box 14177, Fremont, CA 94539. (510) 623-7899. (Sept '90)

Sequelink \$\$\$

An API (application-programming interface), Sequelink provides a faster alternative to Apple's DAL but is difficult to use. Server operating systems supported include VAX/VMS and SCO UNIX/XENIX. Supported database-management systems include Ingres, Oracle, Rdb/VMS, Sybase, and Interbase. Client operating systems supported include the Mac OS, Windows 3.0, and OS/2. Per user, \$695; server, \$4,995. TechGnosis, Inc., One Park Place, 621 N.W. 53rd St., #340, Boca Raton, FL 33487. (800) 275-7565 or (407) 997-6687. (Jan '91)

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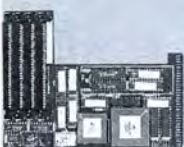
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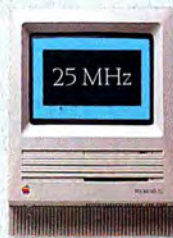
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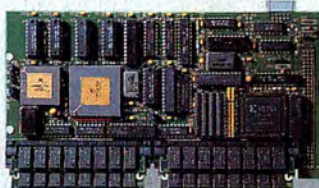
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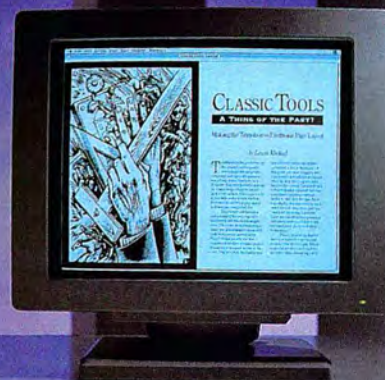
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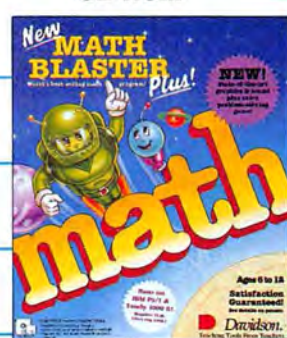
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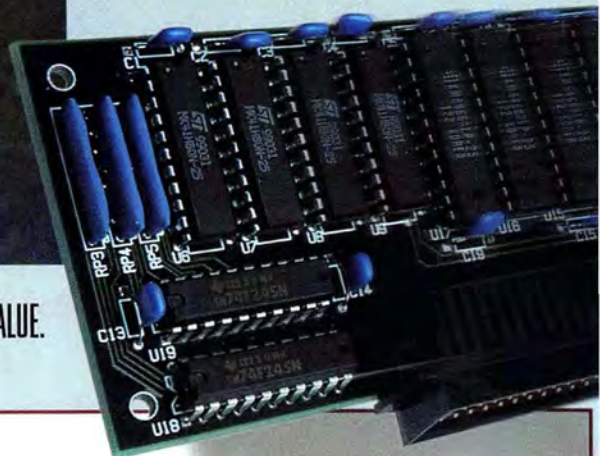
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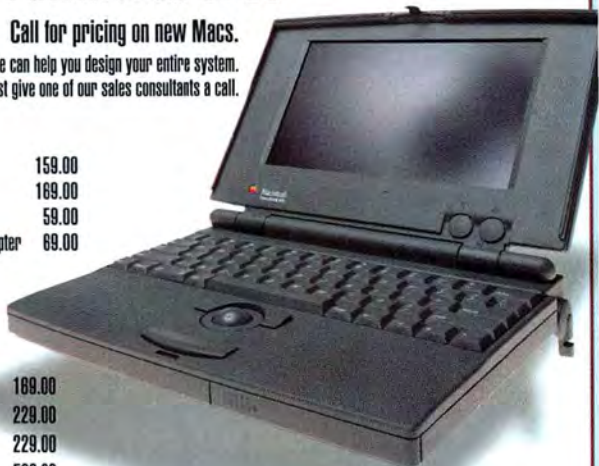
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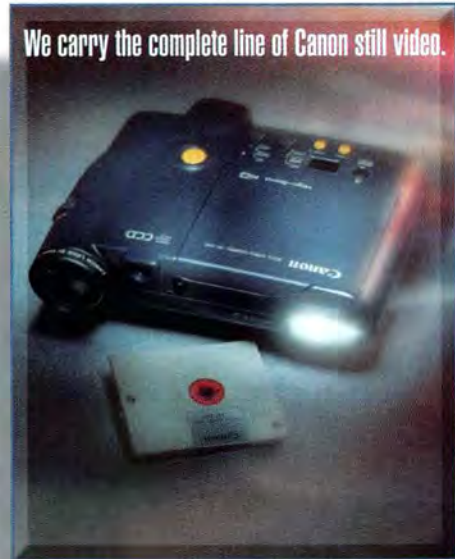
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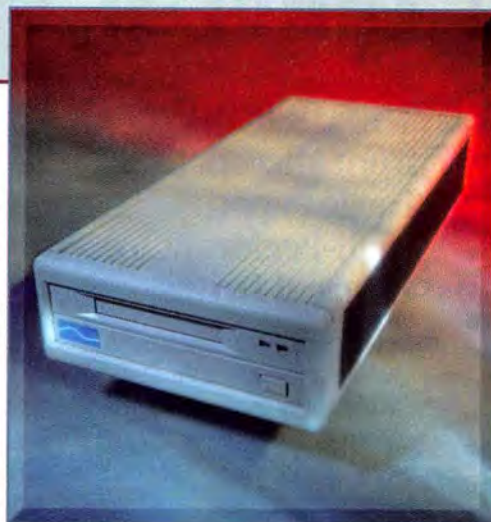


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60MB/17ms	\$244	\$324
80MB/17ms	\$294	\$364
120MB/15ms	\$344	\$454
213MB/15ms	\$584	\$654
340MB/13ms	\$914	\$984
535MB/12ms	\$1699	\$1709
675MB/17ms	\$1354	\$1544
1020MB/13ms	\$1924	\$2029
1500MB/13ms	\$2474	\$2644

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105MB/10ms	\$344	\$414
120MB/10ms	\$344	\$414
210MB/10ms	\$614	\$684
240MB/10ms	\$638	\$738
425MB/13ms	\$1174	\$1244

Seagate

	Intl	Extl
49MB/28ms	\$234	\$304
426MB/14ms	\$1269	\$1329
670MB/16ms	\$1364	\$1514
676MB/12ms	\$1695	\$1845
1020MB/15ms	\$1924	\$2079
1420MB/15ms	\$2424	\$2574

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	Intl	Extl
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120MB/19ms	\$384	\$454
200MB/15ms	\$554	\$624
360MB/12ms	\$920	\$1020
540MB/12ms	\$1174	\$1244

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Quantum

Capacity		Internal	External
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105mb	3.5" LPS 9/25ms*	\$335	\$395
120mb	3.5" LPS 10ms	\$405	\$465
240mb	3.5" LPS 10ms	\$660	\$720
425mb	3.5" PRO 8ms	\$1179	\$1239

Quantum drives carry a **TWO year warranty**. 3.5" Half Height drives are the PRO series. 3.5" Low Profile drives are the LPS series. *3.5" Low Profile drives for the Mac Classic, LC and IIsi. All internals drives include a mounting kit. Externals manufactured by ClubMac. Quadra 900 bracket add \$10

Seagate

Capacity	Access	Internal	External
320mb	14ms	\$1155	\$1215
330mb	10.7ms	\$1249	\$1349
420mb	14ms	\$1269	\$1329
645mb	11.9ms	\$1619	\$1719
645mb	15.5ms	\$1389	\$1489
1.0GIG	15ms	\$1869	\$1969
1.4GIG	15ms	\$2339	\$2439

Seagate drives carry a **ONE year warranty** that can be extended up to a total of **FIVE years**. All internals include mounting kits. Quadra 900 bracket add \$10



FUJITSU

Capacity	Access	Internal	External
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425mb	9ms	\$1179	\$1239
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345mb	16ms	\$1189	\$1289
645mb	16ms	\$1259	\$1359
1.2GIG	11.5ms	\$1919	\$2019

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44mb/88mb Combo			\$989
44mb or 88mb w/ Hard Drive			\$Call



44mb Cartridge

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88mb Cartridge

\$109

Maxtor®

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120mb	15ms	\$349	\$409
207mb	13ms	\$589	\$649
340mb	14.5ms	\$939	\$999
535mb	12ms	\$1369	\$1429
645mb†	14ms	\$1379	\$1479
1.0GIG†	13ms	\$1819	\$1919
1.4GIG†	13ms	\$2429	\$2529

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Our 15" full-page monochrome monitor allows you to see a full 8 1/2" x 11" page without scrolling. Cards are available for the entire Mac line from the Mac Plus on up, so it's compatible with the Mac SE, the SE/30 and the entire Mac II family.

Our 15" monitor features a pixel density of 80 DPI, a refresh rate of 75 HZ and lets you see a full 8 1/2" x 11" page.



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- 9600 bps send/receive fax
- CCITT V. 22bis/V. 22/V. 21
- Maxfax fax software
- MACKNOWLEDGE™
- Integrated modem cable
- 5 year warranty



\$199



Maya Data 2400 99
Maya Data 2400 V.42bis 129

Maya DataFax 96/96 V.32bis

Low cost solution to high speed transfer needs, like running remote access programs, network bridging and large file transfers. Using advanced features of error correction and data compression, you can attain speeds up to 14,400 bps. The Maya Data 9600 will automatically negotiate the highest possible setting with the modem you wish to call.

Features:

- 9600 bps data modem
- 9600 bps send/receive fax
- CCITT V. 22bis/V. 32bis
- Maxfax fax software
- Telecom software
- Hardware handshaking cable
- 5 year warranty

\$459



Maya Data 9600 V.32bis V.42bis 399

CIRCLE 244 ON READER SERVICE CARD.

Applied Engineering
2400 bps modem
internal NuBus
\$79 SPECIAL!
with MNP5 \$99

Hayes SPECIAL!

2400 Smartmodem for Mac II V series Internal NuBus
No manuals included
w/ manual Retail Package

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TeleFinder is without question the hottest thing in BBS software. Use a Maya modem and the same great BBS software we use to run the Maya BBS - "The Veil of Illusion".



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Trade-up Dollars

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ImageWriter II 200
ImageWriter LQ 200
StyleWriter 200
DeskWriter 300

Modems

Hayes

Hayes Personal Modem 2400 with Smartcom II 150
Hayes Ultra Smartmodem 9600 V.42, V.32 699
Hayes Ultra Smartmodem 14400 V.32 bis, V.42 bis 949
Smartmodem Optima 9600 556

Prometheus

Prometheus Mini M 2400 bps 110
Prometheus Mini Plus 2400 bps V.42bis MNP5 142
Prometheus 24/96 Minifax Plus V.42bis MNP5 263
Prometheus 9600M-EC V.32, V.42bis 389
Prometheus 24/96 Remote Plus, MNP5, (battery) 219

Telebit

Telebit T2500 19,200 V.32, PEP, V.42bis, MNP5 686
Telebit T3000 14,400 V.32, V.32bis, V.42bis, MNP5 686
Telebit T1600 9600 V.32, V.42, ASync, Sync 549

US Robotics

US Robotics-Courier HST V.32, V32bis Dual Standard 9600 bps 969
US Robotics-Courier HST 14,400 bps V.42bis 671

Get the New Maya Catalog \$FREE\$

Pages of informative text on how to buy used computers, printers, CD-ROM and more. The Maya catalog is filled with the latest hardware and software, at prices you'll love. Find out why the Maya Catalog has become a much sought after favorite of power users, consultants and Mac enthusiasts everywhere. Call and get your catalog today.



Maya Computer

USA492

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MacWeek, February 1991

"Between the good sales support and tech support that go the extra mile, La Cie is tops in my book!"

Bill Ringle, Philadelphia, PA

"La Cie offers the leading combination of software and performance."

Macworld, March 1990

The La Cie tradition of pride.

Pride in our products. Pride in our commitment to customers. Pride in who we are. At La Cie, "pride" has fueled each and every step in our success. Since our very first product, La Cie has earned an unsurpassed reputation for excellence. Top-rated performance. Award-winning design. From our sleek mass storage solutions to our Silverlining software, no other company in our industry has earned greater acclaim. Or appreciated it more.

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We're proud



La Cie PocketDrive

When size really counts.

As a Quantum Company, La Cie offers customers the advantages of \$489 million in assets. Deep-pockets R&D. State-of-the-art technology. Superior value. And, the assurance of long-term support. Yet for all our size, La Cie's smallest achievements still make our biggest headlines.

Introducing the PocketDrive.™ Portability in the palm of your hand.

Pack it in your pocket, purse or briefcase. La Cie's new 40MB and 80MB power-packed PocketDrives offer ounces of convenience,

La Cie 40MB PocketDrive

\$499

not pounds. Using Quantum's new 2 1/2" drive, the PocketDrive offers 19ms seek time, whisper-quiet operation and La Cie's exclusive switchable termination and SCSI ID.

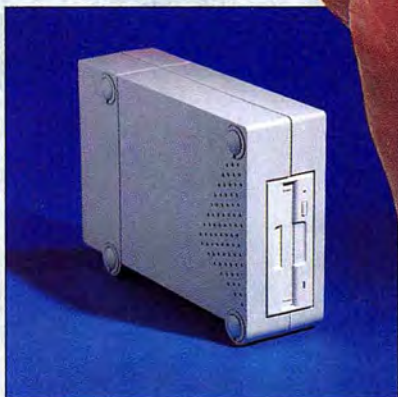
Desktop docking.

La Cie's PocketDrive eliminates the hassle of fumbling with cables at the back of your Macintosh every time you connect or disconnect the drive. Instead, the PocketDrive comes with a unique PocketDock™ desktop docking cable that lets you plug in the PocketDrive in seconds. With a second PocketDock (only \$99), you can have fast and easy connection at work and at home. There's even a miniature T-connector (only \$59) for connecting to other Macintosh systems.

Pocket Silverlining and an extendible 2-Year warranty.

Every PocketDrive comes complete with one PocketDock, our award-winning Silverlining hard disk management software and our extendible 2-Year Limited Warranty. For only \$1 per MB, you can enjoy 72-hour warranty service for up to 5 years.

of our size.



La Cie MicroOptical Drive

Set your sites on a MicroOptical™ magneto optical drive.

Introducing MicroOptical. La Cie's remarkable new 3 1/2" magneto optical drive that offers massive storage capacity, superb reliability and high-speed performance in a compact case.

Space consciousness.

Smaller, faster and less expensive than conventional optical drives, La Cie's MicroOptical uses cartridges that are the same size as 3.5" floppies, but store eighty-eight times more data than high-density floppy disks. Engineered to fit within our space-saving, award-

winning Cirrus case, the MicroOptical offers the reliability of optical media, 30ms seek times and the economy of removable cartridges.

La Cie MicroOptical Drive

\$1699

Lose Weight. Lose Wait.

Until now, optical technology had a reputation for being slow.

MicroOptical drives at 45ms are faster than the conventional opticals.

La Cie's MicroOptical leaves the others in the dust.

Try one on for size.

When you need major-league performance in a pint-sized package, call us. We offer surprisingly small prices and a huge commitment to service and support.

I'm now taking the safer course of buying from corporate-owned companies such as Quantum-backed La Cie..."
MacWeek

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La Cie DAT Drive

La Cie ExpressDrive



La Cie Tsunami

The drive to satisfy.

At La Cie customer satisfaction is the driving force behind everything we do. From our innovative product design to our capable, courteous customer support, La Cie goes the extra mile to assure you quality, service and value.

La Cie award winning chassis.

Quantum power under the hood.

Sleek. Streamlined. Easy handling. Economical. La Cie drives deliver the advantages of award-winning design and state-of-the-art technology. Inside and out. For high-speed performance you can depend on, all La Cie hard drives up to 400MB incorporate the world's most respected and most trusted drive mechanisms—Quantum!

La Cie hard drives from

\$299

Internals. Space savers. Portables.

La Cie offers customers a complete line of hard disk drives featuring state-of-the-art components, whisper-quiet half-speed fans, access times as low as 15ms, wide-range power supplies and La Cie's exclusive switchable termination and SCSI ID.

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- 50MB-1.6GB ZFP
- 50MB-400MB Cirrus
- 50MB-400MB Tsunami
- 50MB & 100MB Bacster™
- 40MB & 80MB PocketDrive

Drive the La Cie Express™

We love all our drives, but take a look at our newest arrival. La Cie's new ExpressDrive™ Perfect for sensitive installations, the ExpressDrive is empowered with the performance of a Quantum fixed drive and the security and convenience of a removable drive, yet none of the risks of open-air media.

ExpressDrive from

\$Call

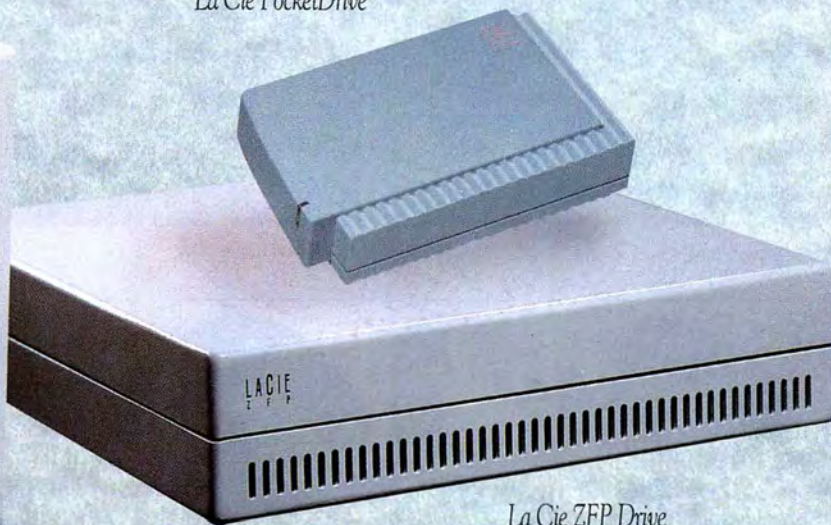
of our drive.

La Cie Cirrus



La Cie MicroOptical Drive

La Cie PocketDrive



La Cie ZFP Drive

Readable. Writable. Removable.

Economical, versatile, ideal for archival backup, La Cie's comprehensive line of removable media options includes:

- Removable cartridge drives
- ExpressDrive
- 3 1/2" & 5 1/4" magneto opticals
- CD ROM

Every drive has a Silverlining.

Acclaimed the most powerful hard disk manager available, La Cie's Silverlining is included free with every hard drive!

Tape backup with Retrospect.

Tape drives from

\$649

Tucked neatly inside our Cirrus case, La Cie's 155MB or 600MB tape drives and 1.2GB or 2.0 GB DAT drives come with Retrospect software offering easy, economical data protection.

Up to 5-year warranty.

Ask about our generous warranties. La Cie offers up to a 5-Year Limited Warranty on Quantum drives and a speedy 72 hour turnaround on all warranty service!

Ready for a drive.

Don't let the quest for the right mass storage solution drive you wild. Call us. Our friendly, highly qualified staff will gladly help you select the perfect device to suit your needs and budget.

"Silverlining has bailed me out of so many tough situations, I've lost count."
Bobker's Dozen Best, MacUser, December, 1990

"La Cie hard disks are the most reliable and convenient disks I've ever had..."
James J. Haf, Lansing, MI.

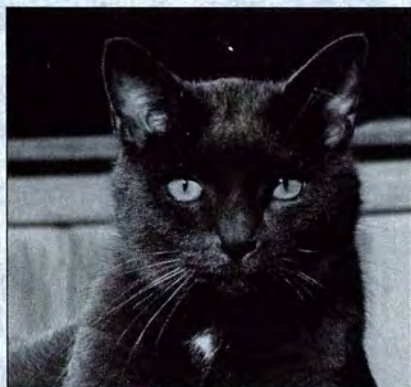
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Microtek 600ZS

\$2,195*



Howtek Scanmaster 3

\$8195**



La Cie Silverscanner

\$1,399



Microtek 600ZS
300 dpi at 1600%



Howtek Scanmaster 3
300 dpi at 1600%



La Cie Silverscanner
300 dpi at 1600%



Microtek 600ZS
600 dpi at 800%



Howtek Scanmaster 3
400 dpi at 1200%



La Cie Silverscanner
600 dpi at 800%

Image is everything.

We believe quality is a priority. Our image as a company that produces quality products is well known. We're so confident in the quality of our scanner image that we are willing to compare it to other scanners right here. Compare for yourself.

Great color the first time.

Just look at the difference in the color scans. The single-pass Silverscanner has three separate noble gas-filled lamps for red, blue and green that are balanced so you get great scans the first time. With Silverscanner's built-in gamma correction, you get clean, bright scans with excellent detail in those hard-to-get areas that don't require difficult adjustment like other scanners. This can mean substantial time savings when every second counts.

The shadow knows.

Do you want good shadow detail? Then compare the black and white scans. The Silverscanner can give you production quality gray-scale scans for magazines, newspapers and brochures.

Lay it on the line.

When comparing line art, the Silverscanner really shines! At 1200 dpi you get what amounts to an *electronic stat*. The comparison is incomplete, however, because some scanners don't have hi-res capability (too bad). But even if you compare at 400 or 600 dpi, it's clear how much better the Silverscanner is, especially bundled with Color It!

La Cie Silverscanner with Color It

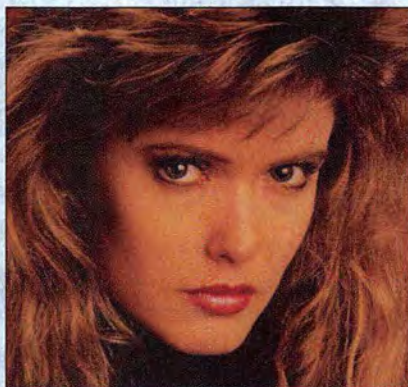
\$1399

Price does not include shipping. Add 5% surcharge for American Express. Add sales tax where applicable. La Cie is a trademark of La Cie, Ltd., a Quantum Company. All other trademarks are the property of their respective companies. *Price advertised in Macworld, Sept. 91. **From Howtek price list, effective 3-1-91. All specifications, terms, descriptions, products and services herein are subject to change without notice or recourse. Bundles in U.S.A. only. Ad design and production by Graphic Witness. Subject photos by Dennis Carney. © Copyright 1991 La Cie, Ltd., 19552 SW 90th Court, Tualatin, OR 97062. Phone: (503) 691-0771, Fax: (503) 691-5590. All rights reserved. Printed in U.S.A.

of our image.



Microtek 600ZS



\$2,195* Howtek Scanmaster 3



\$8195** La Cie Silverscanner \$1,399



Microtek 600ZS
1200 dpi at 400%—n/a

Howtek Scanmaster 3
1200 dpi at 400%—n/a

La Cie Silverscanner
1200 dpi at 400%

All scans were done at default settings with no corrections. The color images were separated using Adobe Photoshop. The logo was scanned as grayscale and as line art. This entire ad was done on the Macintosh using Silverscanner, Photoshop, Quark XPress and a PostScript Imagesetter. The entire production cost was \$145.



La Cie Silverscanner
1200 dpi at 100%



Software to die for!

We're proud of our image when it comes to quality software, too. La Cie has always had a reputation for powerful, well-written software. La Cie's exclusive plug-in modules for Photoshop, ColorStudio, Digital Darkroom, Enhance, ImageStudio and RagTime have been hailed as some of the best software ever written for flat-bed scanners. Enjoy features like fast dynamic color previews, independent color/brightness controls, nine scan modes, savable scan settings, color dropout, magnified previews, proof scans, 25% to 400% scaling in 1% steps, and 25 dpi to 1200 dpi in 1 dpi steps.

Silverscanner is OCR and Apple System 7 compatible and can be purchased with full versions of Adobe Photoshop and Letraset's ColorStudio—a \$2139 value for only \$1899!

La Cie Silverscanner with
Photoshop and ColorStudio

\$1899

Who ya gonna call?

La Cie offers you toll-free expert technical support. We know scanning inside and out. We can help you. And we'll be here for you tomorrow because La Cie is a Quantum Company.

Seeing is believing.

La Cie is so proud of the Silverscanner, we used it to produce this ad. Not just the comparisons, **everything**. Call and order yours today.

"The choice is clear . . . buy the La Cie Silverscanner."
Macworld, June 1991

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We're proud of our value.

50MB Quantum \$299*

50MB.....	\$299 Int.	\$339 Ext.	155MB Tape Drive.....	\$649
100MB.....	\$429 Int.	\$479 Ext.	600MB Tape Drive.....	\$999 \$1199
120MB.....	\$529 Int.	\$579 Ext.	1.2-2.0GB DAT Drive.....	\$1499 \$1799
240MB.....	\$729 Int.	\$789 Ext.	128MB MicroOptical.....	\$1699
400MB.....	\$1399 Int.	\$1499 Ext.	ExpressDrive.....	\$Call
1.2GB.....	\$2009 \$2749 Int.	\$2099 \$2899 Ext.	Silverscanner	\$1399
80MB PocketDrive.....		\$649	Silverlining	\$149

Call for products not listed.

You'll be delighted at La Cie's competitive prices. Especially when you consider what you get absolutely free. Like our acclaimed Silverlining software. Five megabytes of public domain software. A 2-Year Limited Warranty on Quantum mechanisms (extendible to 5 years). 72-hour turn-around on warranty service. Prompt, courteous, competent service.

At La Cie, we take pride in the unsurpassed value we offer customers. From our state-of-the-art technology to our award-winning design, La Cie never stops working to bring you better products and services than ever before. And because we're a Quantum Company, you can be assured La Cie will continue to provide you service and support for years to come.

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*Prices subject to change. Please call for lowest current prices and volume discounts.

Remember the first time you really cut loose with MacDraw® or MacPaint® and really started having fun with your Mac?

Then just wait till you rip through the shrink wrap and get into Magic™.

Suddenly you'll be sending text and graphics flying, spinning and sliding across your screen. And juicing up the action with electronic sound effects or samples of your favorite music.

You might do this just for the fun of it.

Or for the pure power of communicating your ideas with animation and sound.

And you don't have to be a multimedia genius to get started.

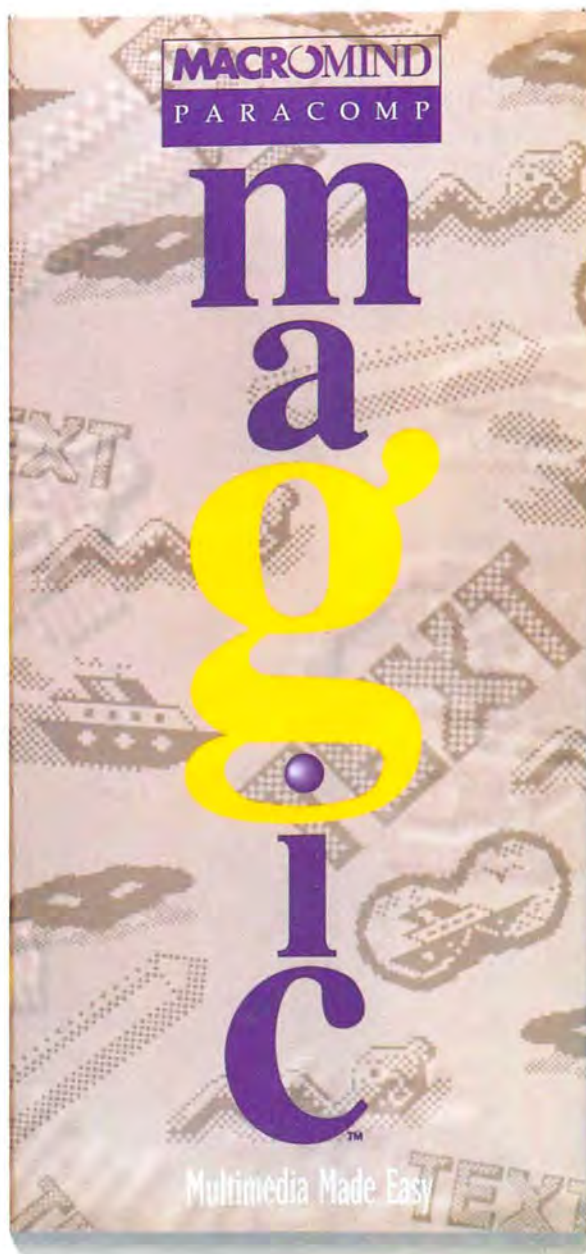
You use a familiar tool palette to create graphics and text. And you use that same palette to put them into action.

In fact, if you can draw a box and a circle, you can instantly make that box run in circles.

You can also add transitions like wipes, combs and irises to move between scenes.

And add interactivity with on-screen buttons.

Like any good Macintosh® pro-



gram, Magic imports graphics and text from other applications.

Like any *smart* Macintosh program, Magic not only runs on System 6.07 or greater, it's also compatible with System 7. And it not only bows to Adobe® Type Manager®, but it's faithful to TrueType™.

Sound too good to be true?

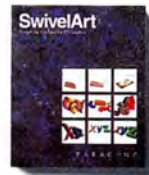
There's more.

Magic runs on *any* kind of Mac—from the Classic and LC, all the way up to the IIfx—so you won't have to spend a dime on new hardware.

You won't have to spend much on Magic either, because it lists for just \$395.

Call 1-800-248-4477 Ext. 920 for more information. Or visit your nearest dealer.

And see Magic happen, right before your very eyes.



Order Magic before June 15th and we'll send you a \$129 library of professional 3D clip art and graphics for your Magic productions —absolutely free. Call today for details.

MacroMind·Paracomp, Inc.
600 Townsend, San Francisco, CA 94103



Welcome to multimedia.



In just over two-and-a-half years, MacroMind • Paracomp has collected more than 19 awards from some of the toughest critics around—the writers and editors who can afford to test everything to see what's best.



Fortunately, *you* can see what's best in multimedia simply by looking at the products to the right.



Like *MacroMind Director*, the all-time champion multimedia product.

And *LifeForms*, our new 3D human figure animation software that lets you put natural human motion into your productions.



Or the already famous *MacRecorder*, which now includes *SoundEdit Pro*, an all new version of the powerful sound editor.



Multimedia Info Kit

Want to learn more about multimedia? For just \$24.95, we'll send you a complete kit of videos, demo disks, configuration guides, how-to booklets, and more. Call 1-800-248-4477 Ext. 220 today.



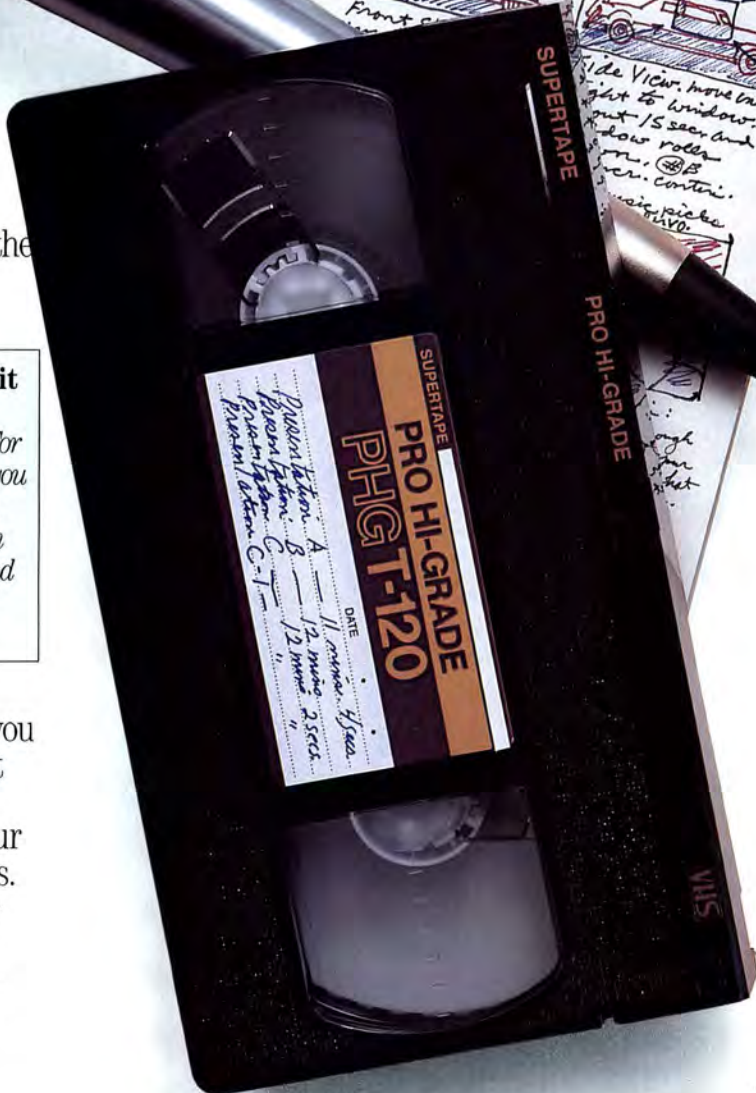
When you're finished shopping, you can pick up the phone. Call us at 1-800-248-4477, Ext. 220.

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Of course, you can also visit your dealer to try out our products.

And see for yourself why the critics are raving.



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MacRecorder® SoundEdit™ Pro

NEW!

Industry favorite sampling, recording and editing sound to tape up multimedia productions, Hyper-Card stacks, even E-mail. SoundEdit Pro, an all new version of SoundEdit, includes an enhanced user interface, unlimited multiple tracks, play and record from disk, the ability to open and save sounds in 8- or 16-bit sample sizes at sample rates up to 48KHz, and more.

SoundEdit Pro, suggested list \$295. Recorder Sound System Pro (includes digitizing hardware), \$349. Special offer! Upgrade from MacRecorder Sound System or SoundEdit to SoundEdit Pro for just \$75.

SPECIAL UPGRADE OFFER



★★★★½



LifeForms™

NEW!

Create sophisticated human motion animations with this new, easy-to-use package. Access shape libraries of figures in sitting,

standing, jumping, sports and dance poses, and more. LifeForms automatically creates smooth human motion between any two positions you define. Add natural human motion to *Swivel 3D Pro*, *MacroMind Three-D* and *Director* productions. Save motion sequences as QuickTime™ movies. Includes XCMD for Hypercard® stacks.

Suggested list, \$495. Special Introductory Offer, \$395. Save \$100. See order form.



ModelShop II™

Create and manipulate realistic spatial models with this completely interactive design and presentation tool. Quickly create models in hidden surface perspective with CAD-like accuracy. Add professional animation with *MacroMind Three-D* for real-time walk-through of architectural models, landscapes and visualizations. The perfect tool for architects and design professionals.

Version 1.2. Suggested list, \$895.

★★★★½



Swivel 3D Professional 2.0

UPGRADE

Model, move and handle objects with this complete modeling and design environment. Hierarchically link object parts. Export 3D views and vector-based 2D drawings. *Swivel 3D* models are compatible with *MacroMind Three-D* and *MacroMind Director* for adding advanced animation to 3D models. Supports 24-bit color, full screen display, Pixar® MacRenderman® output, AutoCAD® DXF output, EPS,

Adobe® Illustrator®, PICT and PICS files.

Version 2.0. Suggested list, \$695. Upgrade for just \$75. See order form.

SwivelMan A special version of Swivel 3D Professional 2.0 that includes Pixar MacRenderman, 1.1. Documentation and tutorials are included to present the applications as one integrated solution. Users can create 3D models and render those models by applying photorealistic textures and shaders in one application. *Suggested list, \$895. Upgrade for just \$175.*



cations. Current *MacroMind* technology enables interactive play on Windows 3.0, Macintosh and some other computer platforms. Create interactive graphics, text and animation with audio and video. Add interactivity with buttons and scripts to create 3D models from *Swivel 3D* from *MacroMind Three-D*, so you can use *MacRecorder* as well as all standard file formats.

Version 3.0. Suggested list, \$995.

MacroMind Accelerator

Speeds *MacroMind Director* animation to professional levels of up to 60 frames per second for smoother action and less screen tearing. Includes tempo control for easy synchronization. Includes XCMD for *Director*. *Version 3.0. Suggested list \$195.*



MacroMind Windows Player

Converts fully interactive *MacroMind Director* productions created on the Macintosh to Microsoft® Windows playback. Supports Windows Multimedia Extension (MME) for

complete interactive control of CD-Audio and video. Includes a license-free demo version for projectors.

Version 1.0. Suggested list \$995, buy a





The Multimedia Company

Who says
our products are
so great?

MacroMind Director®

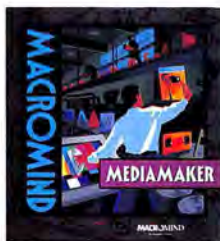
industry standard authoring high-impact, professional multimedia presentations, animations and interactive application player technology. Back on the moon, other lead-ers, combine and d animations full interactiv-ies. Incorpor-ate animation sounds from standard Mac



5. r™ and PICS animations 0 frames per second reen flicker. Features rization of audio and HyperCard® stacks. y, buy direct from us.

ver™ rative r produc- e Macintosh® lows® 3.0 for s Windows sions for dio, digitized e distribution

irect from us.



MacroMind MediaMaker™

The application of choice for assembling and synchronizing video, CD-Audio with Macintosh graphics, sound and animation. Create video

productions and presentations on the Mac. Control external devices: videotape recorders, camcorders, videodisc and CD-ROM players. Compatible with popular Macintosh video overlay cards for video-in-window, titling, transitions and special effects. Fully automated Print-to-Video command allows accurate, easy output to videotape.

Version 1.0. Suggested list \$695.

MacroMind TitleMaker™

Create professional-looking, animated titles and credits to increase the impact of business, education and home videos. Includes over 150 customizable templates. Replace template text and graphics with your own. The perfect complement to *MacroMind MediaMaker*. Version 1.0.

Suggested list \$149, buy direct from us.



MacroMind Three-D™

A professional tool for creating high-quality 3D animations and photo-realistic images for use in video and multimedia productions. Imports a wide range of model file formats and provides a hierarchical time-line for easy animation of unlimited shapes, lights and cameras. Import models from *Swivel 3D* and export animations to *MacroMind Director*. Supports video animation controllers, image special effects (bump and texture maps, shadows, etc.), 3D text

from TrueType® fonts and RenderMan RIB. Version 1.1. Suggested list, \$1,495.

SwivelArt™ Collections

Integrate any of these 3D graphics—royalty free—into multimedia productions, presentations and print publications. Images can be rotated, resized, viewed, scaled, lighted, anti-aliased and used in any perspective or color.

Special. Buy direct from us and save 40%. Suggested list price

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<input type="checkbox"/> 3D Maps I	\$250
<input type="checkbox"/> 3D Maps II	\$250
<input type="checkbox"/> 3D Graphics Original	\$129.95
<input type="checkbox"/> 3D Viewpoint Air and Sea	\$250
<input type="checkbox"/> 3D Viewpoint Anatomy	\$250
See order form.	



If the coupon to the right is missing, you're missing out on great savings. Call for details.



FilmMaker™

The only 2D, 8- and 24-bit animation program on the market with transparency, color animation and full-screen

anti-aliasing/anti-flickering for broadcast quality text and images. Build and animate hierarchical links between graphics for elaborate motion sequences. Export PICS to *MacroMind Director*. Works with Diaquest™ and ARTI™ Arnet™ video device controllers. Offers professional quality animation effects for video and multimedia producers. Version 2.0. Suggested list, \$695.



Action!™ Create dramatic business presentations and demos complete with animation, motion, sound, text and graphics with this easy-to-use Windows-based package. Includes 120 professional presentation templates—select one, change the text, add your own graphics and go. The best tool for presenting from desktop, portable



Presentation Products

absolutely free.

Version 1.0. Suggested list, \$495. Order direct from us before June 15th, and get a Multimedia Remote Control, a



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FilmMaker 2.0



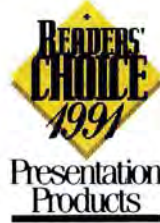
Director 2.0



Director 2.0



Swivel 3D 1.1



Action! 1.0



Director 2.0



SwivelArt 1.2



MacroMind Three-D 1.0



Swivel 3D Pro 1.5



Director 1.0



Director 2.0



ModelShop II 1.2



Director 3.0



Action! 1.0



MacRecorder 2.0



Director 3.0



Director 2.0



Director 2.0

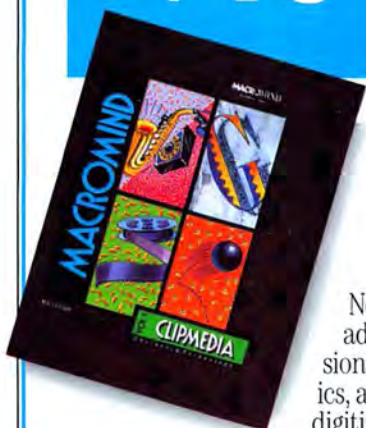


ModelShop II



Swivel 3D 1.2

SAVE \$100



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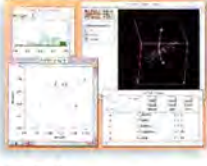
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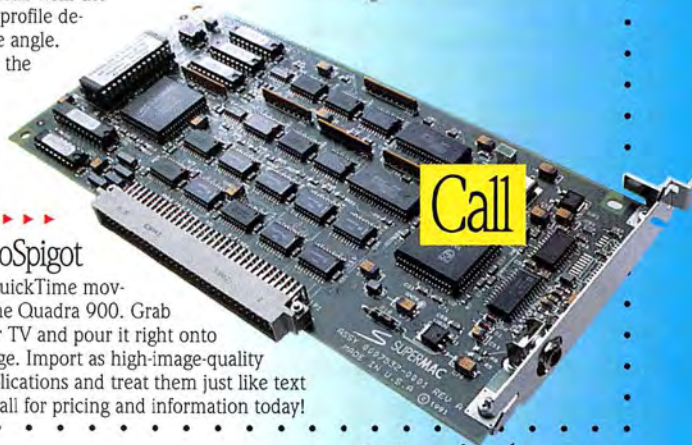
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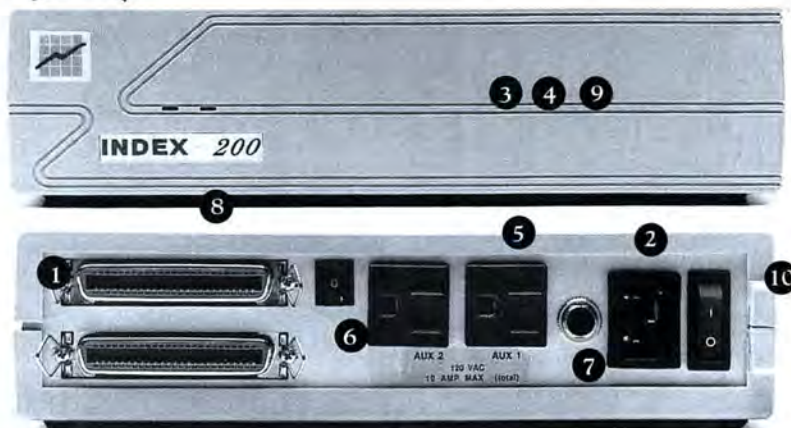


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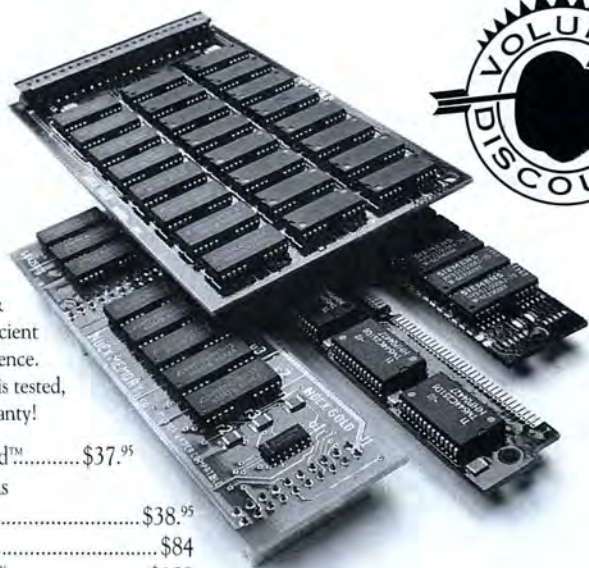
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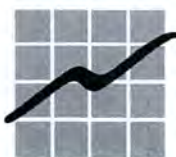
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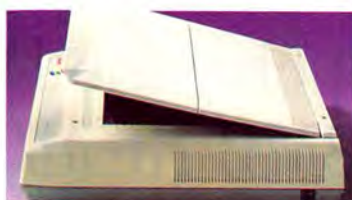
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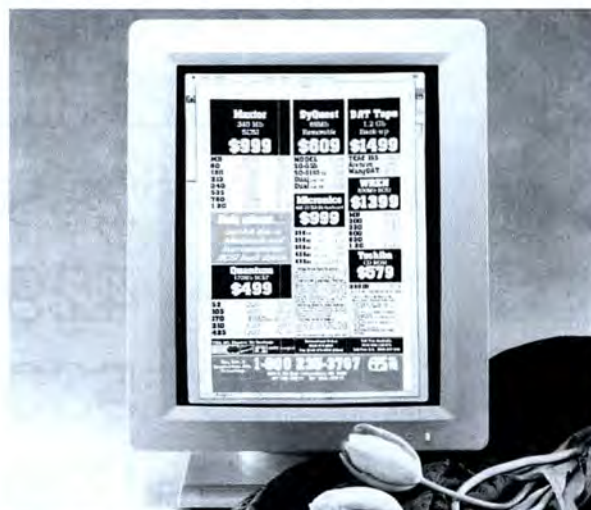
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MB	INTL	EXTL
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PRICE/LEASE PRICE



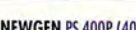
GENERAL PARAMETRICS SPECTRASTAR\$4995 / \$131 mo.*



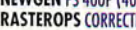
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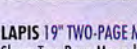


ImageWriter II-Compatible

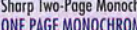
Monitors



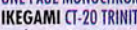
E-MACHINES\$2395
T-16 Futura SXor \$91*
SYSTEM (p/mo. on lease)
24-Bit Accel. Card w/ Spectacular
Trinitron 16" Color Monitor



PRICE/LEASE PRICE
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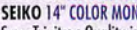
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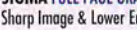
CT-20 8-BIT TRINITRON SYSTEM\$2495 / \$94 mo.*



KEGAMI 19" GRAY SCALE SYSTEM\$1295 / \$49 mo.*



SEIKO 14" COLOR MONITOR\$569 / \$21 mo.*



Sigma FULL PAGE GRAY SCALE MONITOR\$555 / \$21 mo.*



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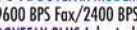
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UMAX UC-630\$1349
24-BIT COLORor \$51*
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PRICE/LEASE PRICE
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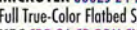
CO-STAR ADDRESSWRITER\$479 / \$17 mo.*



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GLOBAL VILLAGE TELEPORT FULLFAX\$235 / \$5 mo.*



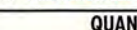
Fax Modem with Auto Fax/Voice Switching & Auto Wakeup of Mac IIs



MICROTEK 600ZS 24-BIT COLOR SCANNER\$1435 / \$42 mo.*



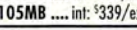
Full True-Color Flatbed Scanner



NEC CDR-36 CD-ROM SYSTEM BUNDLE\$549 / \$21 mo.*

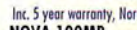


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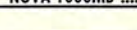
QUANTUM HARD DRIVES



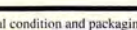
52MBint: \$229/ext: \$299



210MBint: \$629/ext: \$699

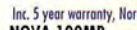


105MBint: \$339/ext: \$429

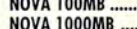


425MBint: \$1299/ext: \$1399

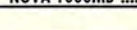
MICROTECH HARD DRIVES



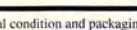
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NOVA 100MB\$675



NOVA 170MB\$949



NOVA 1000MB\$2995

Mac Systems



PRICE/LEASE PRICE
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APPLE MAC IISI COMPLETE POWER SYSTEM\$7965 / \$206 mo.*

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320-321

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Bar Code
CD-Rom
Communications
Computer Systems
Data Acquisition
Data Recovery Services
Disk Drives
Diskettes
General
Input Devices
Insurance
Memory Upgrades
Networking
Peripherals
Printers
Scanners
Security
Used Equipment

SOFTWARE

Accounting
Bar Code
Business
Business Time Management
CAD/CAM
CD-Rom
Desktop Publishing
Educational
Emulation
Engineering
Entertainment/Games
Financial
Fonts
Foreign Languages
Genealogy
General
Government
Graphics
Health
Language Tools
Legal
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Music/MIDI
Networking
Personal Management
Programming Tools
Public Domain
Real Estate
Recreation

PREMIER

CLASSIFIED

BUSINESSCARD

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Religion
Sales Marketing
Scientific
Security
Shareware
Stackware
Statistics
Taxes
Utilities
Word Processing

MISCELLANEOUS

Accessories
Books/Catalogues
Business Opportunities
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Desktop Publishing Services
Diskette Copy Services
Furniture
Insurance
Mailing Lists
Novelties
Services
Slide Imaging Services
Supplies

PREMIER

CLASSIFIED

BUSINESS CARD

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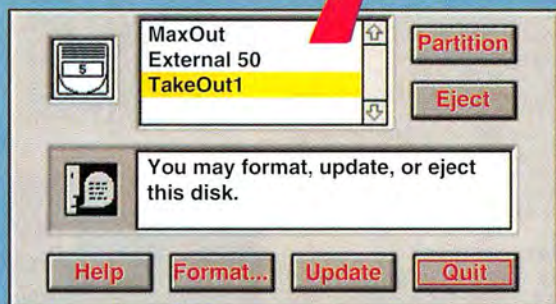
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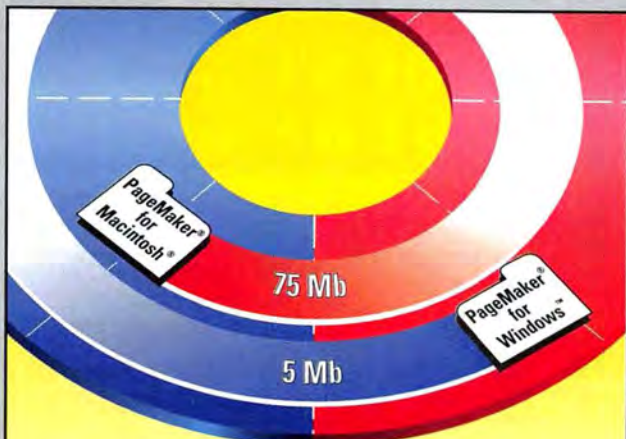
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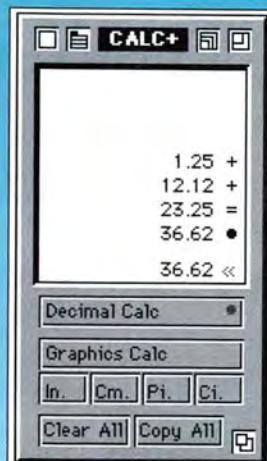
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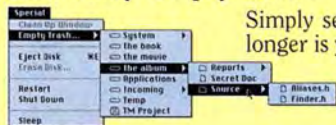
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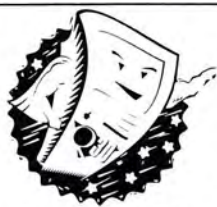
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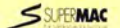
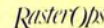
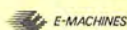
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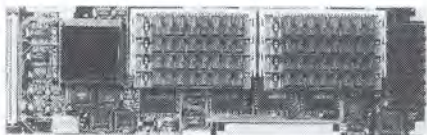
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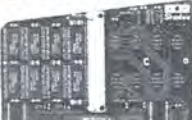
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Mirror Mirror



A backward look at a forward-thinking approach to the first day of the fourth month and why Abraham Lincoln missed out.



Hahahaha! This mirror-image column has that weird April Fools' character you get with a good practical joke. I mean, can you imagine someone casually picking this issue up at a newsstand and seeing this? They'll probably think that it's a massive typo. I suspect that newsstand sales will increase, because this column will be seen as a collectible mistake. Even better, it will also confound those cheap rightwingers who read this column at the newsstands and then put the magazine back on the rack.

The key to a good April Fools' gag is that people somehow discover that the column (or whatever the joke is) is indeed a joke. Anyone who doesn't figure it out becomes a laughingstock. It's a rare opportunity to make fun of the dull-witted and humorless. In some instances, intelligent people fool themselves by finding an April Fools' column out of context. Somehow they find the item in November. This is what may have happened with a recent news report about a virus supposedly spunked into Iraqi computers through a printer chip. Reported as fact, it was actually an April Fools' gag that ran in an industry tabloid last year.

But why make an April Fools' gag just a compilation of erroneous information? Heck, anyone can do that! It's time to get creative. I'm unaware of any other writers using a mirror image of their column as an April Fools' gag. I hate to be derivative. I tried to talk the management into making the entire magazine into a mirror image, but they figured it would cause some kind of reader revolt. Wimp.

In the meantime, I did some research on April Fools' gags and found very little information on the subject. In 1988 there was an interesting article in *Swisswoman* magazine, tracing the day back to All Fools' Day—a medieval celebration. Then the article cited some great April Fools' gags. But uncovering the time at which April Fools' Day actually became an American commonplace is difficult. Few histories even mention the day. I'm sure it became popularized by the Three Stooges or some other comic, probably in the 1930s, when people were bored. I can't imagine anyone pulling a gag on Lincoln, for example, and then shouting "April Fools' Day, Abe!"

Well, maybe the 10th president of the United States missed out on the fun. Abe, this one is for you!

I've made a habit of doing wacky April Fools' columns over the years at *MacUser*. Some gags were better than others. Some were hard to discover. Last year, for example, I ran a bogus story about Agnosticism. It was probably the biggest dud of the lot, because most people read it as fact and those who knew it was bogus figured it was just one of many bogus stories I've written over the years and was actually nothing special.

That's when I decided that the best gags haven't been gags at all, but inconveniences. I'm reminded of the time when I incorporated a second story line transposed over the first, and if you read the column backwards, you got a message from the devil—an IBM representative. It was very inconvenient. Then there was the crossword puzzle. What could be more inconvenient than that? I have since thought about a jumble or some other word game to inconvenience readers.

This year my initial inclination was to write the column backward in its entirety. Recently novelist Martin Amis did an entire novel based on time going in reverse, where the guy starts out old and gets younger. Clean dishes are put in the dishwasher to come out dirty, as poop from the drain contaminates them and then people spit food onto the already dirty dish. The plate full of food is then taken to the kitchen, where the food is re-moved and made raw. You get the idea. A weird concept for a book, to say the least. The difficulty in writing such a book is to make sure the action never goes forward. Well, to write a column like that, you'd have to worry about details. Does "The dog chased the cat up a tree" become "Tee a up cat the chased dog the", and how do you punctuate it? This approach has potential for humor. Unfortunately, to be honest and do the backward column properly, you'd really have to write, "Eet a pu tac chi desach god chi." Now to make that work and make it so people would actually want to read it might take years, which makes topical material impossible, so it would degenerate into stuff like, "Ah, retrosmoc cinew a si hstonicam chi."

Another question is, should you really start at the end and go toward the beginning with the backward stuff or do you do it backward from the beginning?

It was too much to think about, so I decided to do this mirror-image column instead. This technique is humorous (to me at least) and incredibly inconvenient to you, the reader.

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Stephen C. Frantz, Ph.D., member

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"Mirror's done it again. This is a real breakthrough, a 16" Trinitron for \$1299."

— Hilary Koppel

Stephen is not the only one excited about Mirror color systems. Hilary loves the new 16" Trinitron. Designed for the pro who demands the highest quality, but can't justify the high cost, the Mirror 16" Display has 832 X 624 resolution for comfortable viewing of two-page layouts or large spreadsheets.

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If you need a no compromise two-page color display, Michael advises checking out the Mirror ProView.

Available in 8-bit or 24-bit models, the ProView is "a real bargain" according to the May '91

Michael Levy, member



es He Know?"

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"This would be a good scanner for \$2000; for \$1299 it's unbelievable."

— Nancy M. Benz

In December 1991 MacUser gave this scanner 4

Nancy M. Benz, member



mice, saying, "the quality of the hardware is excellent." and it "produced the best images."

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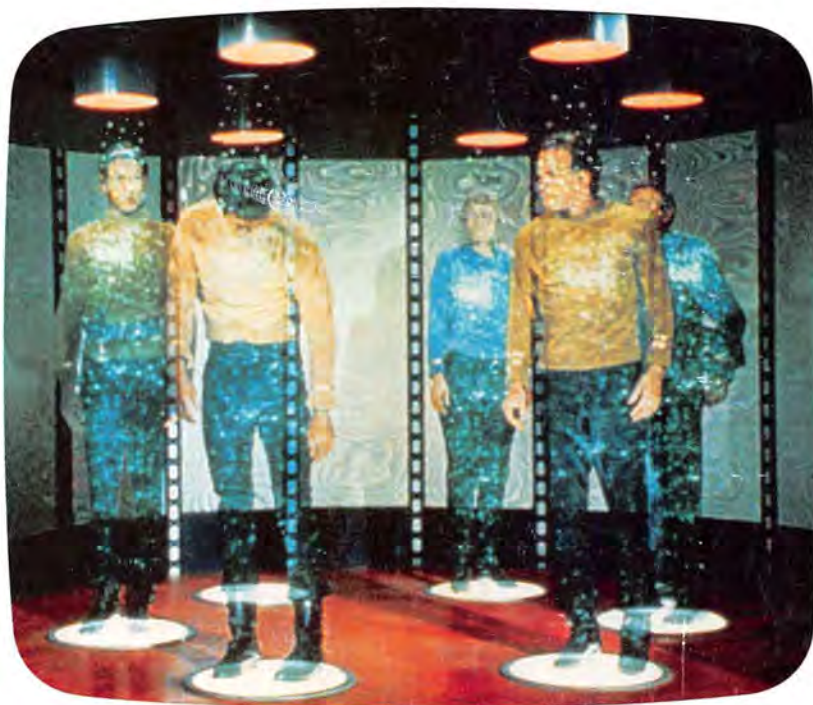
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